No. 43.]

A

DESCRIPTIVE HANDBOOK

OF

MODERN WATER COLOUR PIGMENTS

ILLUSTRATED WITH NINETY-SIX COLOUR WASHES
SKILFULLY GRADATED BY HAND ON
WHATMAN'S DRAWING PAPER.

WITH AN

INTRODUCTORY ESSAY

ON THE RECENT

WATER-COLOUR CONTROVERSY,

BY

J. SCOTT TAYLOR, M.A., CAMB.,
EDITOR OF FIELD'S CHROMATOGRAPHY.

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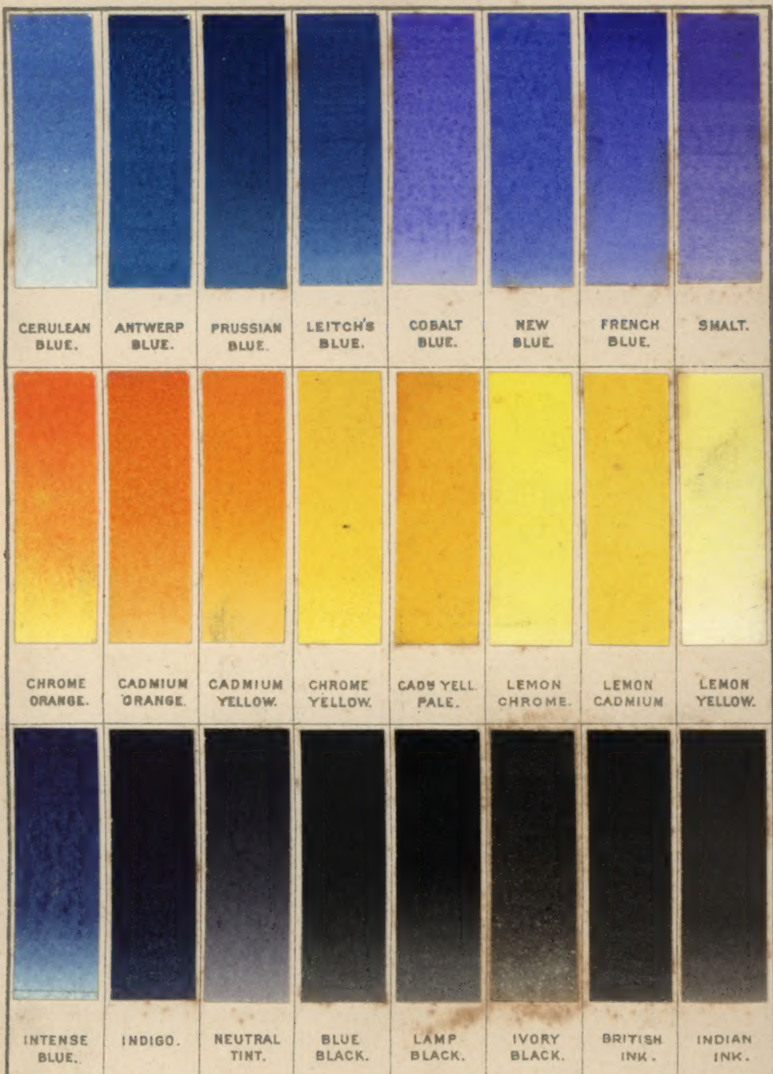

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No. 43.

A

DESCRIPTIVE HANDBOOK

OF

MODERN WATER-COLOUR PIGMENTS

ILLUSTRATED WITH SEVENTY-TWO COLOUR WASHES SKILFULLY GRADATED BY HAND ON WHATMAN'S DRAWING PAPER.

WITH AN

INTRODUCTORY ESSAY

ON THE RECENT

WATER-COLOUR CONTROVERSY

BY

J. SCOTT TAYLOR, M.A. CAMB.,

EDITOR OF FIELD'S CHROMATOGRAPHY.

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PREFACE.

Messrs. Winsor and Newton have for many years past been in the habit of supplying the principal agents who hold their stock with large descriptive albums of their Water Colours. These contain a carefully gradated wash of each pigment, and being prepared on a large scale, and without consideration of cost, are necessarily somewhat expensive.

In consequence of the great utility of, and great demand for, these albums, it was felt that something of the kind in the form of a shilling handbook would meet a very general want among Water-colour Artists.

Messrs. Winsor and Newton therefore proceeded to prepare the illustrative washes, and applied to me to write the descriptive matter to accompany the illustrations; with an introduction on anything I thought of special interest to Water-colour Painters.

I very gladly undertook the task, because it afforded me an opportunity of bringing the Water-colour Artist up to date in many facts bearing on his profession—more especially of revising and qualifying a number of statements about the permanence of his pigments commonly found in the books; and I felt that the subject which, of

all others, would most interest him in an introduction would be that which formed the subject of the 1886 *Times* controversy—the action of light on his colours. I have therefore endeavoured, in the course of a critical essay on the controversy, to bring out many phases of the question which have not been hitherto touched upon; but my principal aim has been to disentangle the really essential points which the controversy has involved from the masses of its irrelevance, and to give to them, as far as possible, their due order of emphasis.

The descriptions of individual pigments are based upon those in my 1885 edition of "Field's Chromatography." In this section of the book I am indebted to Mr. W. J. Winsor for revising the proofs, and the suggestions he has made acquire a special value from his long practical experience in the manufacture of Water Colours.

The most recently published data about the action of light on Water-colour Pigments are given in the Appendix; and there are many unpublished results within the reach of those readers who are able to attend Prof. Church's annual series of lectures before the Royal Academy.

J. SCOTT TAYLOR.

Highgate,
September, 1887.

CONTENTS.

"The general point on which the natural feeling of the public needs confirmation against troublesome gossip is the essential quality and value of water-colour painting as a piece of polite art.

Pure old water-colour painting, on pure old paper, made of honest old rags.

There is no china painting, no glass painting, no tempera, no oil, wax, varnish, or twenty-chimney-power-extract-of-everything painting which can compare with the quiet and tender virtue of water colour in its proper use and place. There is nothing that obeys the artist's hand so exquisitely; nothing that records the subtlest pleasures of sight so perfectly. All the splendours of the prism and the jewel are vulgar and few compared to the subdued blending of infinite opalescence in finely-inlaid water colour; and the repose of light obtainable by its transparent tints, and absolutely right forms to be rendered by practised use of its opaque ones, are beyond rivalship, even by the most skilful methods in other media.

Properly taken care of—as a well-educated man takes care also of his books and furniture—a water-colour drawing is safe for centuries; out of direct sunlight it will show no failing on your room-wall till you need it no more; and even though in the ordinary sense of property it may seem less valuable to your heir, is it for your heir that you buy your horses or lay out your garden? We may wisely spend our money for true pleasures that will last our time, or last even a very little part of it; and the highest price of a drawing which contains in it the continuous delight of years cannot be thought extravagant as compared to that we are willing to give for a melody that expires in an hour."

John Ruskin.

(*Letter to the Times*, April 14, 1886).

INTRODUCTION

ON THE RECENT

WATER-COLOUR CONTROVERSY.

IN the earlier months of 1886 a great stir was caused in artistic circles by a controversy in the *Times* newspaper on the action of light on water colours. It was contended on the one hand, by the more theoretical and scientific section, that water-colour drawings were evanescent if exposed to even ordinary diffused daylight for any length of time, and the effect of such exposure for twenty or thirty years on our national collection at South Kensington was stated to be so well marked that the pictures were all more or less irrevocably injured. Indeed, the danger was considered so imminent that it was even suggested that they should be withdrawn from public view and stored in portfolios; or else, if the masses of the public were still to have access to them, that they should be exhibited only in the evening by an artificial light which had no injurious effect.

On the other hand, the artistic and optimistic faction, including men of the greatest eminence and experience in their profession, denied in the most emphatic manner the truth of these allegations, which seemed so seriously to compromise the future of their art. It was even stated that many old water-colours were now absolutely richer and deeper in tone than when first painted. That changes

often took place was not denied; but these changes were attributed, not to the action of daylight, but to other avoidable causes, such as old methods of painting, bad paper, damp, injudicious mixtures in general, and mixtures of Indian Red with delicate colours in particular.

The question which had been raised was necessarily a very serious one for water-colour painters, and the effect of the temporary scare was very distinctly felt, both by artists and dealers, in the increased difficulty with which they were able to dispose of water-colour drawings.

The scare, however, was only temporary; Mr. Ruskin wrote a letter like the sound of a trumpet—a marvel for rhythmic power of expression and largeness of touch—and the pendulum of public opinion paused and began to swing back. The reaction was completed by a loan exhibition of paintings organized by the Royal Institute of Painters in Water Colours, and held in their council room at Piccadilly. The collection was composed entirely of pictures more than thirty years old; most of them had been exposed in frames since they were first painted, and the exhibition was intended to prove that these pictures were practically unchanged since they left the hand of the artist, and that many of them were more brilliant and rich in colour than modern works of the same class.

Those readers who wish to follow out the details of the controversy are referred to the original *Times* letters, the dates of which are given in the Appendix, together with particulars of their reprint, and of other sources of information on the subject. Our more immediate object is, after

careful study of these letters and sources of information, to examine the strength of the arguments used by both parties, and to show that the apparently irreconcilable masses of fact adduced on each side may be, to a great extent, harmonized by careful analysis to indicate how sources of misunderstanding may exist on both sides, and to show, in short, that, although the scientific man is not wrong, in a way, yet that the artist is, in a way, right, and that (as is usual in the bitterest controversies) their antagonism is mainly based on mutual misconception.

In the first place, it will be necessary to point out that there are two distinct methods of proof which have been relied on by advocates on each side of the question, each of which has its own special advantages and disadvantages. We will term these the *Scientific* and the *Artistic* methods respectively.

The *Scientific Method* has consisted essentially in making washes of modern water-colour pigments upon paper of ascertained purity, cutting up such washes into two slips of perfectly identical colour, and exposing one of these slips to daylight and sunshine while the other is kept in the dark. These slips are compared at regular intervals, the amount of change noted, and the results thus obtained are made the basis of statements about the permanence of water-colour paintings.

The *Artistic Method* has consisted in producing actual water-colour pictures which have undergone no change perceptible to the most experienced artists after certified exposure to ordinary daylight for periods varying from twenty or thirty years to half a century.

The *Scientific Method* has these advantages—the proof is absolutely rigid, as far as it goes; and, moreover, it deals with each individual pigment. The disadvantages are, however, perfectly well marked, for a proof obtained in this way is of only indirect application to water-colour paintings, inasmuch as the conditions which obtain in the latter are usually far more complicated. The best water-colour paintings may be said, practically speaking, to consist entirely of *mixed colour*, and it is exceptional to find any appreciable portion of the picture occupied by any one particular pigment. If we could assume that every pigment in a mixture would behave, under the action of light, in exactly the same way as if the other pigments were absent, then our trial slips would yield results of far greater value; but, unfortunately, such an assumption would be distinctly at issue with observed facts, and, although in many cases the decomposing action of light would still take place, yet it is perfectly well established that in many others the more fugitive pigments receive very great protection from their comrades. This very indirectness of the scientific method of proof may undoubtedly be a great source of error; for, although it is not easy for the scientific man to be wrong in his facts, it is very easy for him to be wrong in the conclusions he draws from those facts.

The *Artistic Method* of proof, although less rigid than the other, has the advantage of being *direct*. The only errors to which it is liable are errors of evidence; and perhaps a tendency to be regarded as an absolute rather than only as a relative proof. The latter alone is necessary—but of this more will be said later on. The scientific method is misleading by reason of its very rigidity, and is apt to lead to

unnecessarily exaggerated conclusions when the results obtainable by its application are used as the basis of indictments against the permanence of water-colour drawings.

It may, moreover, fairly be questioned, upon the strength of the data which are before the public, whether the scientific method of proof has been scientific enough. It has been stated that this method of proof has consisted in preparing two identical slips of colour and exposing one of them to sunshine, because in all the published experiments the slips *have* been exposed to a large amount of direct sunshine; and we draw especial attention to this point, because however much doubt may exist among artists with regard to the injurious action of diffused daylight, about the destructive effect of direct sunshine there has never been *any*. "None but a madman," says one of the most optimistic advocates of water-colour permanence, in a letter to the *Times*, "would expose any picture to the full blaze of the sun."

"But," say the water-colour pessimists, "the difference between the action of direct sunlight and of ordinary daylight is simply one of degree; and effects which are produced in a short time by the rays of the sun will also be produced by ordinary daylight in more lengthened periods." "For," to quote their principal spokesman, "*the light of the sun is the same whether direct or infinitely lowered or mitigated*."

This sentence has been put in italics from a conviction that it touches the vital point of the whole controversy. Only one advocate on the artistic side has alluded to the statement, and he seems content to surrender a point to which he might safely have given an unqualified denial. For, although the assertion seems to have a *primâ facie* plausibility, it is

nevertheless erroneous. The light of the sun is ***not*** "the same, whether direct or infinitely lowered and mitigated"; but on the contrary there is a physical difference in constitution, which, apart from all other considerations, would afford the strongest presumption of difference of effect.

Most substances in nature and, with the exception of the carbonaceous blacks, all artistic pigments, are composed of structural elements called molecules, which are in turn made up of two or more (sometimes a great number) of dissimilar atoms. Thus each molecule of the colouring principle of carmine is composed of nine atoms of carbon, eight atoms of hydrogen, and five atoms of oxygen bound together; and the colour of carmine depends entirely on the intactness of these molecules. Directly they are decomposed the colour is destroyed. Now, one great feature of the more complex molecules—such as these of carmine—is, that they will not stand a particular intensity of vibration without being shaken to pieces. Moderate vibration they may perhaps bear, but if the rapidity of vibration is gradually increased there comes ***a point, different for each pigment, at which disruption occurs.***

Sunlight and ordinary daylight consist, as is well known, of rapid vibrations of ether which are capable of being communicated to material substances; and thus it is that many pigments, especially those with the more complex molecules, are destroyed by its action. Of this we shall speak more in detail later on. The point which immediately concerns us is the difference between sunlight and daylight, which is this—that although the wave lengths of the red rays or the green rays, etc., are the same in both, yet the rapidity

of oscillation of the ethereal particles which generate these waves is immensely greater in the former than in the latter.

If one were to argue that "because a given substance undergoes chemical decomposition if heated for a short time to a certain high temperature, therefore it would also be decomposed if heated for a longer time at a much lower temperature," he would be met with derision. The decomposition of the substance does not at all depend on the *quantity* of heat it receives, but on the *intensity* of that heat; nor does the decomposition of a pigment under the action of light depend at all upon the quantity of light it receives, but upon the intensity of the light.

Many of the extremely diverse statements which have been made about the action of light on pigments are due without doubt to the different intensities of light which have been used by different experimenters; and many differences of opinion between experimenters and artists are undoubtedly explicable by the fact that the former, in their eagerness to establish the impermanence of a theoretically unstable colour, use as a rule a far more severe test than any it would be called upon to bear under the usual conditions of artistic exposure. The only legitimate way of exposing the slips of colour (and these, beside the simple colours, should include all useful mixtures) is to put them in frames and hang them on the walls of a room, under precisely the same conditions as those to which a water-colour is usually subject. This is an entirely different thing, even though there be no direct sunlight, to placing them in the glare of a window-pane; and, in comparison with the usual scientific practice of window-exposure *plus* sunlight, is as different as night and day. And

there is one further point to be noted; if the slips of colour, *under glass*, are exposed to direct sunshine, a new factor—temperature—comes into play; and not only has the man of science increased the intensity of his light far beyond allowable limits, but he has built a small greenhouse for storing heat and baking out the colour. Prof. Stokes has recently stated this action of glass in sunlight to be so well pronounced that a vessel of water may be boiled if placed within two or three glass enclosures, and exposed to the rays of the sun.

There is, however, one way in which the severer forms of test may have a value, *i.e.*, that although if a pigment is injured by sunlight we have no right to say it is also injured by diffused daylight; yet if a pigment withstands the sun's rays without change we may, *cæteris paribus*, very legitimately assert that ordinary daylight will be without action upon it.

And now, having shown that such a phrase as "the action of light" is entirely without meaning when the intensity of the light is not defined, we will proceed to show that even when the intensity *is* so defined, the action of light varies so much in its nature that the expression may bear different meanings under different circumstances.

For although in some cases light is able of itself to effect the decomposition of a pigment, *yet, in the vast majority of cases, it acts rather by assisting the work of such other influences as oxygen and moisture than by any direct operation of its own.* And, indeed, the conjoint action of the members of this particular triad—*light*, *oxygen*, and *moisture*—is by far the deadliest we have to contend with in striving to secure the permanence of water-colour pictures.

In the case of oil-painting, where the pigments are to a

great extent "locked up" in an oleo-resinous environment, the action of light, in its phases of assistance, is far less marked; and the alterations which it occasions are usually of secondary importance in comparison with those (such as darkening of colour and cracking of the surface) which arise from the action of the medium. But in water-colour painting the pigments are applied under such conditions that the danger arising from exposure to light becomes a maximum. Not that the argument that water colours fade more under the action of light than oil colours, because the former are applied in attenuated films and the latter in layers of considerable thickness, possesses much strength as it stands (for, if the top layer of colour particles, which sends the greater bulk of light to the eye, be faded, what matters it, except for the very transparent colours, how great the quantity of colour underneath); but because in water-colour painting the oxygen and moisture are enabled to co-operate with thelight, since they have an access to the particles of pigment which in oil colour the medium denies.

It has been stated that if some of the more fugitive pigments are hermetically sealed in vacuo, they may be exposed to light freely without suffering change; thus showing that in their case the real function of light was to facilitate the action of oxygen and moisture.

Then, again, it has been found that many delicate pigments may, if kept in the dark, be exposed to the action of oxygen and moisture without suffering change. And recent discoveries in chemistry leave little doubt that light and oxygen would usually effect no change if moisture were absolutely excluded.

So that, however much we may classify primary causes, it is not as a rule the action of any single cause which does the mischief, but of a concerted attack of two or more of them, any one of which will, in presence of the others, determine a decomposition which would often in its absence not occur.

A glance at the results obtained by various experimenters on the action of sunlight on pigments (see Appendix) will show that those pigments which are of mineral origin (such as *Light Red* and *Cobalt Blue*) are comparatively little affected by sunshine; whilst those (such as *Carmine* and *Gamboge*) which are organic in their origin, *i.e.*, are derived from the animal or vegetable kingdom, are peculiarly liable to its influence. Chemical science asserts that the ultimate units or "molecules" of the mineral pigments are simple in constitution, and consist of but few atoms, whereas the organic pigments are far more complex, and contain many atoms to the molecule; and that to this fact of simplicity or complexity of ultimate composition the permanence or impermanence of a pigment is mainly assignable. It is universally accepted nowadays that light consists of wave motion caused by the excessively rapid and minute vibrations of an imponderable medium, which fills all space, pervades the interior of even the most compact and solid substances, and to which the name of the "luminiferous ether" has been given. The action of light on our pigments is thus, as we have already indicated, essentially vibratory in its character. By the communication of rapid ethereal tremors, complex molecules are put into a condition of oscillatory instability, and are either shaken bodily to pieces or fall an easy prey

to the action of such disintegrating influences as atmospheric oxygen and moisture If the intensity of the light is comparatively small, then the rate of vibration is also comparatively small, and the molecules of pigments do not (as in moderate daylight) become sufficiently agitated to suffer either direct or indirect decomposition. But gradually increase the intensity of this light, and, as we have already stated, there comes a point, different for each pigment, at which the degree of molecular vibration passes the limit of safety, and our pigment—*fades*.

In the last few paragraphs we have endeavoured, by showing the real complexity of the action of light, to indicate the great difficulty of arriving at accurate experimental conclusions. There are so many sources of error to be guarded against, that we need all our care and all our science to prevent our results from acquiring a misleading significance.

A habit of generalizing from the results of solitary experiments is one very fruitful source of error which cannot be too greatly avoided in conducting an accurate investigation into the action of light on pigments. Thus, suppose it is found that a wash of carmine is bleached in a fortnight by direct sunshine, and in a few years by the action of window exposure to daylight. This at first would seem to bear out the assertion italicised on p. 5; but in reality it proves nothing—except for carmine; and only *this* for carmine, that the limit of the intensity of light which it will bear without decomposition is below that of strong daylight. There is, therefore, no reason why moderate daylight, such as obtains on an ordinary wall, should not be as safely below this limit as window exposure is unsafely above it.

Then again, a great deal has been talked about the violet or chemical rays of light, and just because these rays are the effective ones in decomposing the silver salts of photography, it is assumed that they play an equally important part in the decomposition of pigments. This is, however, by no means the case. On the contrary, it has been shown in recent years that the kind of ray which is most effective depends upon whether the chemical action is one of oxidation, of reduction, or of simple dissociation; upon the simplicity or complexity of the molecule—or, in other words, whether it be mineral or organic in its character; and finally, it is naturally dependent on the colour of the substance itself.

With regard to the suggested employment of the electric light as a substitute for daylight in the exhibition of water colours, it may be remarked that there is as yet no ground for the belief that any form of the electric light is less injurious to delicate colours than diffused daylight *of the same intensity, and accompanied by the same temperature, and the same conditions of exposure.* All theoretical considerations are against such a belief; there is no practical evidence to support it; there *could* be no practical evidence to support it, except on the strength of many long years of trial. The artist will, therefore, at present, not be warranted in regarding the scheme as anything more than a speculative possibility.

Besides the main practical proof of water-colour permanence offered by artists in the Piccadilly Exhibition, they have suggested that many changes attributed to the action of light have really been due to other causes, which may be summarized as follows:—

(1.) The old method of water-colour painting before it was revolutionized by Turner and Girtin consisted in first executing the picture in grays, and then applying more brilliant colours. These have since sunk into the dull ground and produced an appearance of fading.

(2.) The old water-colour painters painted in a very low key, and so their works are taken to have faded when exhibited in juxtaposition with more brilliant examples.

(3.) Many changes which have been referred to the action of light are really due to damp, to bad paper, and to chemical action arising from injudicious admixtures in general and from the action of Indian Red on Indigo in particular.

There is certainly a good deal of strength in each of these contentions. The absorptive action of a dull gray ground seems to have been a matter of general observation half a century ago, and is referred to in a treatise by the old water-colour painter George Barret. But of all the minor points which have been raised much the greatest stress has been laid upon the action of Indian Red on Indigo, which seems to be notorious among artists, although the scientific section have denied that it can take place. "Indian Red," says the latter, "is not only permanent by itself, but is without action on other colours"; and undoubtedly every chemist would at first hand be tempted to make this statement.

But the artists retort with hard fact. "How is it that when we mix Indigo with Light Red and Venetian Red our Indigo is not affected, whereas mixtures of Indigo and

Indian Red invariably turn rusty?" a fact which artists hold, not by proof of isolated cases, but by the universal experience and observation of their profession for a long series of years, to be indisputable.

In a matter of this kind, where chemical theory is in conflict with artistic fact, the very foundations of chemistry as an experimental science teach us to reverence the experience of the artist. "Facts," said Gay Lussac, "are incontrovertible, but theories may be changed and modified." "Analogy," said Sir Humphry Davy, "is the bane of chemistry; the only legitimate use of analogy is to connect facts together and guide to new experiments." It is therefore our duty, as chemists, to see if there is nothing within the range of our experience which will render another conclusion tenable. Perhaps this section cannot be better concluded than by showing how such a one is possible.

In the ordinary sense of chemical action, which is essentially mutual between two bodies, it may no doubt be true that, in a picture where the Indian Red remains in fiery patches, and the Indigo has fled, there has been *no* chemical action; the Indian Red was sesquioxide of iron to start with, and sesquioxide of iron it remains. But there is a border-land of phenomena between the sciences of Chemistry and Physics in which actions take place of an entirely different kind—a region which is especially the domain of the colour-chemist, and which at present is shrouded in Egyptian gloom. Is there then, in the first place, among the obscurer phenomena of chemistry, any which may cause us to pause before asserting definitely that Indian Red has no action on Indigo (pre-supposing, of course, that it is well washed

and free from soluble matter)? We think one may fairly say that such phenomena do exist under the modern name of "Contact Action" and the ancient one of "Catalysis." They furnish instances in which one substance seems to be able to assist the decomposition of another without itself undergoing any change.

This being so is there, in the second place, any reason to suspect Indian Red (sesquioxide of iron) to be capable of exerting a catalytic action? Has it ever been observed to act in this way? To this we may reply that there are very strong reasons, inasmuch as it is a metallic oxide, one of a class of bodies to which such actions are most peculiar; and furthermore, that we have distinct evidence of sesquioxide of iron playing such a part. It has, for instance, been found to be as effective as oxide of manganese in promoting the decomposition of potassium chlorate at abnormally low temperatures. Why, then, should it not be capable of assisting the decomposition of Indigo under the influence of abnormally low intensities of light, especially when this light is assisted by the presence of oxygen and moisture?

There is, however, one more enquiry to be made. Supposing that sesquioxide of iron *is* capable of assisting the decomposition of Indigo in a catalytic manner; yet Venetian Red and Light Red are also based upon sesquioxide of iron, and is there any reason to suppose that in one form it may be catalytically active and in others inert?

Even apart from other considerations, the mere fact of different molecular condition should be enough to establish this possibility. But there is a significant difference between Indian Red and the other two colours.

Indian Red has been until lately a natural variety of rust brought from the Persian Gulf, and the oxide of iron it contains is present in a peculiarly free and active condition. The other two pigments are of artificial origin, and having been produced by calcination at high temperatures, have acquired a condition of great molecular stability.

The artificial imitations of Indian Red which have, in recent years, been substituted for the genuine pigment may be very possibly, like their similarly produced compeers, quite unable to assist the decomposition of Indigo under the action of light and atmospheric agencies; and they are, in any case, undoubtedly safer to use.

Let us now examine the strength of the case made out by the artists by means of the Piccadilly Exhibition. What, in the first place, was it necessary for them to prove, and how far did they succeed in proving it? It was necessary for them to prove this,—that it was possible for water-colour drawings, painted with the usual colours and methods of manipulation, exposed to ordinary daylight on the wall of a room, and treated with ordinary care as to seclusion from damp and sunlight, to endure for from thirty years to half a century without change appreciable to those eyes which, by education and experience, were most qualified to judge. They had no more than this to establish. They were not called upon to demonstrate that no change could be discovered under the scrutiny of a microscope, or revealed by the analysis of a battery of prisms; they only needed to show that there had been no change perceptible to ordinary eyes and memories, and therefore no change of practical

importance to art. That they *did* prove this is beyond the shadow of a doubt. The *Times* (which throughout sided with the pessimists), in a leader after the collection, says:—"It certainly proves that a very large number of drawings have been hung on the walls of their owners' drawing-rooms for forty or fifty years without the least damage or loss of beauty. But it does not prove more than this." We do not think the artists had anything more to prove. It may of course be assumed that all these drawings had been kept "behind curtains during a considerable part of their existence"; but not only is such an assumption contrary to all probability, and to human nature, but it has been definitely stated by the owners to be, in the case of nearly every picture, contrary to fact.

Though there be, through the length and breadth of England, twenty faded drawings in existence for every one that is unfaded, this has nothing whatever to do with the question. For (after such a proof as the above has once been given) it can only have one meaning,—that for every drawing that is properly taken care of, there are twenty that are ruined by damp and sunlight and dirt; and that for every drawing that is painted with reliable pigments properly associated, and on good paper, there are twenty that are painted either on bad paper, or with insecure and badly mixed colours. If, instead of the hundreds that were instantly available, the artist had only *one* picture to produce and every other in existence were faded, then if his one picture fulfilled the conditions laid down at the commencement of this paragraph, he would have established his case.

And now, having put extreme cases to point out a principle, we may remark that it is very doubtful whether the faded drawings in the world outnumber the unfaded ones to the extent that is generally supposed. But we must remember that the former for attracting notice have everything in their favour; for in all mundane affairs, those which arrest our attention are those which come to the fore. We pass by many an old water-colour drawing in perfect preservation, giving no thought to its permanence; while a palpably faded specimen engages our attention immediately.

Artists have been accused of having shown an unnecessary amount of irritability over the whole question; but when they are confronted by authoritative assertions that water-colours under the action of daylight "fade daily and hourly even," and begin to die from the very moment of exposure, a little warmth of feeling seems somewhat excusable. Such statements as these may mean one thing to the scientist, but to artists they mean quite another; and they are the more dangerous because, from an absolute point of view, they may not be untrue. Let us suppose that a given wash of colour fades perceptibly in a century, and that the change is gradual and progressive, it is then of course literally true that it is fading "daily and hourly"; ordinary people, however, naturally take such a statement to mean that the daily and hourly change is of practical importance and perceptible to the eye. If, therefore, one, in treating of this controversy, is tempted to show a decided sympathy with the artistic side of the case, the excuse is not far to find; for, although both parties may have been guilty of error, they are not equally

guilty of the practical consequences of that error. It has been stated that their antagonism was based on mutual misconception; but there is this difference in the effects of such misconception. It matters not a jot whether the artist misconceives the man of science; it is easy enough for the latter to prove that the former only wants a clear head to set him straight, and Science stands unshaken on her pedestal. But if the thinker himself is guilty of misconception, it is a thousand times more difficult for the practical man to show where he is wrong (however much he may *feel* it.) And so, when the most delicately-beautiful art in the world is at stake, it matters everything for an exponent of science to blunder. No caution can be too great for him to exercise in pronouncing a verdict against it on any evidence short of absolute demonstration; no language in conveying such a verdict can be too carefully guarded against exaggeration and possible misconstruction; nor can any reprobation be too strong for careless neglect of these palpable duties.

We have said in a preceding paragraph that one of the errors to which the artistic method of proof is liable is that the results obtainable by its application are often taken to be absolutely rather than as only relatively true. It is easily imaginable that many an old water-colour drawing, asserted to be unchanged on eminent artistic authority, would not bear the rigid test of being placed side by side with (if it were possible) a perfect duplicate, which had, by some means or other, been preserved exactly as it left the hand of the artist. But it is no doubt true that *only* by such a test could any change be discovered. It must be remem-

bered that our sense of colour is still developing, and is not nearly so accurate as our sense of form; and the limits of accuracy between which we are unable to distinguish between two colours are in comparison tolerably wide. It has been found that the wave-length of many varieties of light may be altered very considerably without any difference of hue being detected by the eye. If this is the case when we use a method of direct comparison, how much more must it be true for comparisons of memory?

And so, for all practical purposes, the relative truth of an experienced artist's assertion is as good as if it were absolute. If the change which takes place in good water-colour drawings exposed to daylight under conditions of ordinary care is so small that those artists of our day who are subtlest in appreciation and discrimination of colour assert that, as far as their eyes can discern, and for all intents and purposes of delight, and of truth within the limits of our perceptive faculties, such pictures are unchanged after a long series of years, how much more shall the lovers at large of water-colour art—who paint, for the most part, no pictures, and for whom it is enough to gaze at them in the galleries and buy them for their homes—how much more shall they, with eyes far less educated and acute, rest content with the practical permanence of English Water Colours in spite of all the clamour of all the science in the world?

SECTION I.

THE SOURCES OF

WATER-COLOUR PIGMENTS.

"Some lump, ah God, of *lapis lazuli*,
Blue as a vein o'er the Madonna's breast."
(The Bishop orders his Tomb at St. Praxed's Church.)

ALTHOUGH the modern march of chemistry may seem to have taken from the sources of pigments much of the old romance, and one is tempted to surmise that Mr. Browning's bishop—had he lived nowadays—might have been less rapturous of a colour to be had in any quantity of Monsieur Guimet; yet we have not quite, with all our powers of analysis and synthesis, been able so far to dispense with Mother Nature's services, and many of our best pigments are still, as they have been from times immemorial, products of her handiwork.

Even for our inorganic pigments this is true, and many of the more noteworthy of them are derived from the crust of the earth—inimitable now, as they were in the days of the old Egyptians; not to be made in an hour in the workshop of a chemist, but slowly elaborated by the centuries, and depending, for their valued properties of texture, mellowness, and permanence upon this self-same slow elaboration.

And if it is true for many of the natural inorganic pigments that we are not able to supplant them, still more is it true for those which owe their origin to the activity of living tissue in plants and animals; and so, while we recognise that there are powers in the production of pigments that are beyond us, and that will always be beyond us, we have no cause, on the score of romance, to dread the strides of science among the enchantments of old "rules of thumb." Scientific men will indeed go still farther than this, for Science, ruthless iconoclast though she may appear to the superficial gaze, reveals, when rightly pursued, more marvels than she destroys; and the study of pigments is, on this account, more interesting nowadays than ever it can have been when pursued by Cennino Cennini, and its other devotees among the dark labyrinths of the Middle Age.

Having thus pointed out that many of the natural pigments baffle, and must inevitably baffle, all the imitative efforts of human ingenuity, there is one more thing to be done:—to show that, in the production of artificial pigments, chemical science has its limits as well as its virtues; and having said a good word for the colour making of nature, to give its due to the operation of human intelligence, other than in that required for utilizing science.

It may be stated without exaggeration that every artificial pigment is, in its perfection, beyond the reach of mere chemical skill. Colour making is in fact an art, and as such is dependent on the operation of causes which escape the analysis of sciences such as that of chemistry. The true function of chemistry in colour making is to serve as a guide to the experimentalist, and to give direction to his

efforts; and if, as is usual in these days of the almightiness of science, we endeavour in our practical efforts to invest chemistry with any higher value than this, it becomes a hindrance rather than a help to progress.

Chemistry is indeed of such value that it is not too much to say that the whole time from the Egyptians to the close of the eighteenth century might have been wasted in fruitless efforts to manufacture ultramarine. For not until modern chemical analysis revealed the constituents of the colour was it known exactly what kinds of material it would be necessary to put together to give a chance of success; and not till then did it become possible for M. Guimet to achieve the result with which his name will always be principally associated, although it was afterwards independently achieved by other experimenters. But it must be remembered that the step from analysis to the successful production of ultramarine was a long one, and that in this stage chemistry was of little avail. This part of the business had to be accomplished by patient exercise of those two faculties—observation and ingenuity—which are the primal qualifications for a colour maker. It would be found, for instance, that to obtain the best results the temperature should be of just such height and long continuance, that the door of the furnace should be open just so much, to admit a certain precise amount of air, and so forth. To these things chemistry was no guide, and of them it could give no accurate account; and by the observation and remembrance of such facts as these the *art* of ultramarine manufacture came to be established.

And now with the observation that we have taken ultra-

marine for a type because in its natural state it is the most beautiful and celebrated of pigments, and because in its artificial form it requires perhaps the highest perfection that has yet been attained in the *art* of colour making, we will pass to the details of our chapter.

Water-colour pigments may be arranged in three groups, in accordance with their origin, and they may be still further classified as follows :—

Pigments derived from the Mineral Kingdom.	Native Pigments. Artificial Pigments.
Pigments derived from the Vegetable Kingdom.	Native Pigments. Lakes and Indirect Products.
Pigments derived from the Animal Kingdom.	Native Pigments. Lakes and Indirect Products.

This table is arranged to be roughly indicative of relative durability. The native minerals being, as a class, the most permanent, and the animal lakes the most fugitive.

PIGMENTS DERIVED FROM THE MINERAL KINGDOM.

Among the Native Mineral Pigments, *Lapis lazuli*, or *Genuine Ultramarine*, brought from many parts of Asia, and principally from China and Thibet, stands pre-eminent for brilliancy and purity of colour, as also for permanence and historical associations; and although it may be matched to the sight very perfectly by the artificial ultramarines of modern times, it will probably never be equalled, for transparency and durability, by any product of human skill.

Ultramarine Ash is a weaker variety of Ultramarine. *Yellow Ochre* and *Brown Ochre* are native earths coloured by sesquioxide of iron; some of the best varieties of modern Yellow Ochre have been brought from the neighbourhood of Oxford; but it occurs in nearly every country, and in olden times there were celebrated localities in Egypt for obtaining the colour. *Raw Sienna* is a particularly transparent variety of Yellow Ochre which takes its name from Sienna in Italy. *Raw Umber* is named from the ancient town of Ombria (now Spoleto) in the same country, and differs from the ochres and siennas in being tinctured principally with oxide of manganese instead of oxide of iron. The best Raw Umber is at present brought from Cyprus. *Vandyke Brown* is a native bituminous earth brought principally from Cassel in Germany. The admirable pigments, *Light Red*, *Burnt Sienna*, *Burnt Umber* and *Cologne Earth*, must also be included in this category of native minerals, inasmuch as they are produced by simple calcination of *Yellow Ochre*, *Raw Sienna*, *Raw Umber*, and *Vandyke Brown* respectively. *Terre Verte* is a very durable green earth coloured with protoxide of iron. *Genuine Indian Red* is brought from India and Persia; it consists principally of sesquioxide of iron, and is valued for its subdued and beautiful quality of colour. It has been largely replaced in modern times by an artificial preparation which is an exceedingly close imitation; and we may here mention two or three pigments which were originally used in their native forms, but have been now altogether replaced by superior artificial products. *Cinnabar*, or *Native Vermilion* (known to the Egyptians), has long since been replaced by the artificial Vermilions. *Orpiment*,

or Golden Sulphide of Arsenic, was also known to the Egyptians, and constituted the "Auri-pigmentum" of the Romans; it is now discarded in favour of the artificial Sulphide of Arsenic known under the name of "King's Yellow." And, lastly, the native red and yellow *Chromates of Lead* are now forsaken for the more beautiful, and not more fugitive, precipitation products.

Turning to the ARTIFICIAL MINERAL PIGMENTS, we find that they may be divided into two classes—those made by *dry processes* (calcination in furnaces), and those made by *wet processes* (precipitation from aqueous solution).

Among the Artificial Pigments made by the DRY PROCESS we may class the different varieties of *Vermilion*, which are compounds of sulphur with the metal mercury. They were formerly only obtainable in perfection from Holland, but are now produced in England of equal beauty. The Vermilion made in China is still very celebrated. The *Cadmium Yellows* and *Cadmium Orange* are compounds of sulphur with the metal cadmium. *King's Yellow*, a compound of sulphur with the metal arsenic, now replaces the native sulphide. *Mars Yellow* and *Mars Orange* are artificial ochres prepared from salts of the metal iron. *French Blue*, or *Artificial Ultramarine*, was very cleverly synthesised by French chemists early in the nineteenth century, in imitation of the Genuine Ultramarine of "lapis lazuli," and is now largely manufactured in France and Germany. Its colour seems to depend on a compound of sulphur with the metal sodium. *New Blue* is a pale variety of French Blue. *Cobalt Blue* was also invented in France, and is essentially a compound of the oxides of the metals aluminium and cobalt.

Smalt is a ground blue glass coloured by oxide of cobalt; it was invented in Saxony in the 16th century, and is still obtained from the neighbourhood. *Cerulean Blue* is a combination of the oxides of tin and cobalt. *Venetian Red* and the *Artificial Indian Red* consist essentially of sesquioxide of iron, and are both made in England. *Oxide of Chromium* is, as its name implies, an oxide of the metal chromium; and the splendid *Viridian* is of precisely similar chemical constitution, but contains some water of hydration to which its superior transparency and beauty of colour are referable. Finally, the indispensable *Chinese White* is an oxide of zinc.

The Artificial Pigments made by the Wet Process comprise *Aureolin*, a double nitrite of the metals cobalt and potassium; the *Chrome Yellows* and *Chrome Orange*, containing the metals chromium and lead; the beautiful *Lemon Yellow*, containing chromium and barium; *Pure Scarlet*, the dazzling combination of iodine with the metal mercury; the matchlessly vivid *Emerald Green*, a compound of acetic acid with the metals arsenic and copper; and *Flake White*, or carbonate of lead.

In addition to these pigments there are also varieties of *Vermilion*, *King's Yellow*, and the *Cadmium Yellows*, which are made by the wet process; but they are considered to be very inferior in permanence to those obtainable by the dry methods. Indeed, in most cases where a pigment may be prepared by both wet and dry processes, the latter should be preferred as giving the more durable product. For those pigments which are sulphides this statement is particularly true.

PIGMENTS DERIVED FROM THE VEGETABLE KINGDOM.

There are only two Native Vegetable Pigments:—*Gamboge*, a gum which exudes from a tree in Ceylon; and *Indigo*, the "Indian Blue" of ancient writers, which is obtained by fermenting an infusion of the leaves of the "Indigofera" plant. *Intense Blue* is a purified extract of Indigo.

In turning to the Vegetable Lakes, it will be necessary, in the first place, to explain what is meant by a "Lake." The coloured fluids obtainable from various plants and animals have attracted attention from the earliest times, and have always been used for dyeing fabrics; but inasmuch as these colours were mere stains, and had no body or substance, they were not available as pigments to the earlier painters. But in the Middle Ages it was found that many attractive pigments could be made by staining chalk and other white earths with these coloured fluids. These primeval "lakes," as they were termed, were, however, merely stained earths; much of the colour could be washed away from them, and they were little more permanent than the original dyes. It was reserved for chemistry to show that a white gelatinous precipitate of alumina was *the* substance for fixing coloured extracts, and that, moreover, in this case the resulting pigment was not merely stained alumina, but a definite compound of alumina with the colouring matter, from which, in most cases, the colour could not be removed by washing. This is what we now understand by a *Lake*.

Among the Vegetable Lakes, and, indeed, among all

water-colour pigments, the madder colours, *Madder Carmine*, *Rose Madder* or *Madder Lake*, *Pink Madder*, *Brown Madder*, and *Purple Madder* are pre-eminent, not only on account of their beauty and delicacy of colour, but also by reason of their great durability. They are obtained from the root of the madder plant (*Rubia tinctorum*), which is largely cultivated in Turkey, France, and Holland. *Brown Pink* is sometimes obtained from the berries of a shrub (*Rhamnus amygdalinus*) which grows in Persia; but the best modern Brown Pink is made from Quercitron Bark, the bark of a variety of oak (*Quercus tinctoria*), which grows in North America. *Yellow Carmine*, *Italian Pink*, and *Yellow Lake* are also lakes prepared from Quercitron Bark. *Violet Carmine* is a lake obtained from the root of the False Alkanet (*Anchusa tinctoria*), which is grown in Spain and Greece. *Indian Lake* is derived from a resinous secretion found on the branches of trees in Siam and Bengal.

Among the Indirect Products of the Vegetable Kingdom we must note *Lamp Black*, the soot obtained by burning substances of vegetable origin; *Blue Black*, the charcoal of vine twigs; and *Bistre*, the soot of wood fires.

PIGMENTS DERIVED FROM THE ANIMAL KINGDOM.

The Native Animal Pigments are three in number:—*Indian Yellow*, a deposit obtained from the urine of the camel, has been employed in India as a pigment from the earliest times. *Sepia* is a secretion used by a cuttle-fish (*Sepia officinalis*) for obscuring the water when it wishes to escape from danger or bewilder its prey. Sepia is brought

principally from the coasts of the Adriatic Sea. The now nearly obsolete *Gallstone* is a calculus formed in the gall-bladders of oxen.

The only LAKES OF ANIMAL ORIGIN are prepared from the cochineal insect, which flourishes in Mexico, the West Indies, and Java, and furnishes us with *Crimson Lake*, *Purple Lake*, *Indian Purple*, and the rich and velvety colour so renowned under the name of *Carmine*.

Finally, among the INDIRECT PRODUCTS of the Animal Kingdom we may include *Prussian Blue*, inasmuch as the prussiate of potash used in its manufacture is prepared by fusing refuse animal-matter with impure carbonate of potassium. And with *Ivory Black*, obtained by careful charring of ivory, and which also comes under this heading, we complete our summary of water-colour pigments.

It may perhaps be worth while to say a few words, at the close of this review, about the possibility nowadays of discovering new pigments. Although it is the general opinion of artists who are not chemists that new pigments can be evolved with ease from the immense variety of material substances on the face of the earth, and that, as a recent on-this-occasion-only optimist has phrased it in the *Nineteenth Century*, "the resources of nature are infinite if science is once brought to bear," yet there is really very little hope of such expectations being realised. One must remember that for a new pigment to succeed it must fulfil two conditions, each of which is a *sine qua non*. In the first place it must be

wanted—must be better than other pigments of its class ; and in the second place it must be permanent.

From the region of *Artificial Chemistry* there is, at present, no prospect of an absolutely new pigment of such a character. The field of *Inorganic Chemistry* has been ransacked since the commencement of the nineteenth century. Every coloured substance in the crust of our planet has been scrutinised and submitted to analysis ; all the metals that this crust contains are known and all their compounds. A few of these compounds, such as the yellow obtained from indium, are reputed to possess properties which might constitute them desirable pigments ; but the metals from which they are derived occur in quantities too minute to be available to commerce. It is, however, in the possibility of larger sources of these metals being discovered that Mineral Chemistry gives us most hope of an absolutely new pigment.

The field of *Artificial Organic Chemistry*, which now mainly occupies the attention of chemists, gives us no hope whatever. To see that its resources for the discovery of new colouring principles are unbounded we have only to look at the Aniline Dyes ; and to see that its resources for securing the artistic impermanence of colour are also unbounded we need still but look at the Aniline Dyes. With all its wealth of colouring matter, no eligible artistic pigment has yet been produced by Organic Synthesis, and the only organic colours that are even fairly permanent are obtained through the agency of plants and animals.

There is indeed, with the *Madder Colours* before us, some hope that our far-away cousins in distant parts of the globe may stumble across new roots or berries, or what not, with

dormant virtues for colour making. But for us in England, where we know the produce of every square inch of the soil, there is no such prospect, and we can but wait for the news from the ends of the earth.

There is, however, one prospect for us in our English laboratories—and it is in every way a hopeful one—the prospect of improving those pigments we *do* possess, and introducing more brilliant, or beautiful, or permanent variations of older colours. Our resources in this direction are undoubtedly boundless, and one may almost spend a lifetime in specialising on a particular pigment. So much has been done in this way of late years, especially by our neighbours on the Continent, and the results have been so noteworthy and fruitful, that we may probably look in this direction of improvement for the more immediate contributions of Chemical Science to the Palette of the artist in water colours.

From the short summary which we have just concluded, the artist will see that (as on the British Empire) the sun never sets on the sources of his pigments; and having endeavoured to increase his conception of the intrinsic beauty and preciousness of what are, after all, but the stones with which he has to build, we leave him to obtain with them far higher forms of beauty, by combining them in that "subdued blending of infinite opalescence" to which "all the splendours of the prism and the jewel are vulgar and few."

SECTION II.

DESCRIPTIONS OF
WATER-COLOUR PIGMENTS.

WHITE PIGMENTS.

Chinese White

Was introduced in 1834 by Messrs. Winsor & Newton, and since that time has been universally adopted by water-colour painters as *the* white for their profession. It is valuable not so much for any particular good quality, as for an unrivalled combination of excellences. There are, in fact, four main qualifications which an artist requires of his white pigment:—permanence, body, opacity, and beauty of colour; and although Chinese White is, in one or two of these properties, by no means the equal of either Flake White or Constant White, yet it has the advantage over these two pigments in being fatally deficient in none of them.

Chinese White consists of oxide of zinc prepared by a peculiar process, the effect of which is to confer upon it great increase of body. It is perfectly permanent *per se;* and experience has borne testimony to the fact that it may

safely be mixed with all other colours. Theoretically, being a metallic oxide, we might not expect it to possess, in admixtures, the absolute inertness of Constant White. Practically it has been found to do so.

Chinese White varies very much in body and properties, according to the amount of skill bestowed on its preparation, and much of the Chinese White now in the market possesses pasty and clogging properties and a lack of body which are altogether foreign to the genuine preparation.

Well-prepared Chinese White is equal in colour to the best samples of Flake White and Constant White. It has but one drawback, a slight lack of opacity, which gives it a bluish character when applied in thin layers.

Constant White,

Also called *Permanent White*, ranks as a white water-colour pigment second to Chinese White. It consists of sulphate of barium prepared by a process of precipitation, and is one of the most absolutely unchangeable substances with which chemists are acquainted. Like most pigments which are super-eminent in respect of permanence, it possesses great artistic drawbacks: a fatal lack of body, a very unpleasant manner of working, and finally a habit of drying several tones higher than when wet, and thus subjecting even an experienced artist to considerable uncertainty when he uses it in compound tints. Constant White should be carefully tested before use, to make sure that the last traces of the sulphuric acid employed in its manufacture have been washed away.

Flake White,

Or *White Lead*, consists chemically of carbonate of lead. Although our most valuable oil-colour pigment, it has in water colour been entirely superseded by Chinese White.

Flake White in its magnificent combination of body and opacity is superior to all other white pigments; but unfortunately is so peculiarly liable to the action of an impure atmosphere that it cannot be considered eligible as a water colour. In oil colours it is to a great extent protected from the atmosphere by being locked up in the hardened oleo-resinous medium; but in water colours, where no such protection is afforded, it is subject to rapid discoloration; and in old water-colour drawings has invariably gone black. Sometimes in such cases, when used by itself in high lights, etc., and not in admixture with delicate colours, it may be satisfactorily restored by applying a solution of peroxide of hydrogen; but the whiteness (due to the oxidation of black sulphide of lead into white sulphate of lead) is only temporary, and it has been stated to be even more liable to discoloration than before.

A further description of Flake White would be here entirely out of place. It is practically obsolete in water colour.

RED PIGMENTS.

Vermilion.

The Vermilions of commerce vary very much in hue, and range from deep reds of a crimson character to paler ones

of scarlet and orange hues. All of them are practically identical in chemical composition, and consist of sulphide of mercury.

The colour is also found native as the mineral "cinnabar"; but although employed by ancient painters, this natural variety is now entirely superseded by the artificial preparations.

The "Vermilion" of water colours, when used without an adjective, invariably denotes the deep crimson-hued variety. When pure and well made it is a very permanent pigment. It has sometimes been thought, by evidence of old illuminations, to blacken in time, a change of colour which is, theoretically, well understandable and attributable not to any chemical decomposition, but rather to molecular change.

Sulphide of mercury exists in two modifications, one of which is red and the other black; and as they possess, as far as chemists have been able to discover, precisely the same chemical composition, it has been thought that the difference of colour is simply due to a different arrangement of their "molecules" or ultimate particles.

We have, however, no evidence that the old illuminators employed the pure pigment.

Modern Vermilions have an extremely good reputation for permanence, and in oil colour this reputation is undoubtedly well deserved. It is probable that in water colour something depends both upon the mode of manufacture and upon the medium with which a colour is mixed, as the results of experiments are somewhat at issue.

Mr. Simpson found a wash of Vermilion exposed for

fifteen years showed no change, and Professor Hartley, after fourteen days' exposure to sunshine, arrived at the same result; but, on the other hand, Professor Rood, by three and a half months' exposure to sunlight, found Vermilion became darker and brownish.

Vermilion possesses great opacity, and is so extremely heavy that it is apt to separate from other pigments with which it has been mixed. It is therefore best used in conjunction with the heavier colours. A habit of washing up renders it difficult to manage, but when skilfully used it is one of our most valuable pigments. Being a sulphide it is entirely unaffected by an impure atmosphere.

Scarlet Vermilion

Differs from the preceding in being paler and more scarlet in hue. In respect ot permanence and general properties it is perfectly similar.

Orange Vermilion

Is still paler, and farther removed towards yellow. It is, however, rather an orange-red than a true orange. Orange Vermilion is more transparent, and washes far better than the other varieties; for landscape painting it is certainly the most useful of the Vermilions yet described.

Field's Orange Vermilion.

It is found in practice that Orange Vermilions prepared by the ordinary process have one very decided drawback in comparison with the deeper varieties; they are apt to

separate into a heavier and deeper portion which sinks, and a paler portion which floats on the surface.

Field's Orange Vermilion is obtained from ordinary Orange Vermilion by an elaborate process of levigation, which succeeds very perfectly in producing a homogeneous product. It is brighter and purer in colour than the preceding, more transparent, and possesses the additional advantage of undergoing no separation.

Field's Orange Vermilion is, therefore, to the landscape painter by far the most useful of the series.

Pure Scarlet

Consists chemically of iodide of mercury, and is prepared by precipitating a solution of mercuric chloride with one of iodide of potassium.

Pure Scarlet has all the body and opacity of Vermilion, but is as much inferior to it in permanence as it is superior in brilliancy. "Of all artistic pigments it is at once the most dazzling and the most fugitive."

The iodine and mercury which enter into its composition are both volatile substances, and are held together by very feeble bonds of chemical affinity. Even apart from these defects, it exists, like Vermilion, in two allotropic modifications, one of which is scarlet and the other yellow. But unlike Vermilion, the change in molecular condition takes place with the utmost suddenness and caprice—in fact may sometimes be determined simply by scratching the surface with a pin-point, or by warming gently—the whole of the red colour changing to yellow.

Pure Scarlet is rapidly blackened by an impure atmo-

sphere, and by exposure to light and air, or even if shut in a book, fades away altogether. It cannot be mixed with other metallic pigments without utter destruction. It has been stated that a thick glaze of gamboge or gum-arabic adds to its stability.

"As a landscape pigment Pure Scarlet is out of the general scale of nature; but in illumination and in flower-painting its attractions are almost irresistible. Nothing can approach it as a colour for scarlet geraniums; but its beauty is as fleeting as the flowers."

Light Red

Is one of the most valued of water-colour pigments. It is prepared by calcining Oxford Ochre (a natural earth coloured with sesquioxide of iron); and the finer the quality of this ochre, the better is the resulting red.

Light red is one of the "little band of pigments which in permanence are beyond fear and beyond reproach." It is simply invaluable to the landscape painter, giving fine grays with cobalt, and admirably serviceable compounds with most other pigments. In colour it is a rather dull orange-red, with a fair amount of transparency.

Venetian Red

Differs from Light Red in being an artificial preparation, although very similar in chemical composition. It is usually prepared by calcining protosulphate of iron, the "Green Vitriol" of commerce, and carefully washing the product.

Venetian Red is very similar to Light Red, but is less orange in hue, less transparent, and decidedly more powerful

in colour. With Light Red it shares the good quality of absolute permanence, both *per se* and in admixture with other colours.

Indian Red

Is similar in chemical constitution and absolute permanence to Light Red and Venetian Red, although very different in point of hue. Genuine Indian Red is a natural earth brought from Bengal and Persia, and is valued for its purple hue, and for the clearness of its tints. It is now largely replaced by Artificial Indian Red—an exceedingly good imitation.

Although, as stated above, it is by itself extremely durable, yet there is a very general consensus of opinion among water-colour painters, that it often in mixed tints assists the decomposition of delicate colours, and its action in this way upon Indigo has become notorious. There is no doubt from a chemical point of view a distinct ground for such a possibility, inasmuch as the sesquioxide of iron contained in the native variety of this pigment is in a particularly uncombined and active condition; and although it may have no direct action on the Indigo, is at the same time capable of assisting the action of light, oxygen and moisture. It is, however, the opinion of Mr. W. J. Winsor, who has placed his experiments at the author's disposal, that the artificial varieties of Indian Red are entirely without action on Indigo; and this endorses the opinion of Prof. Church on the question.

Carmine.

A very rich and intense lake, prepared by precipitating the colouring matter of cochineal in combination with the smallest possible quantity of aluminous base.

Unfortunately for water-colour artists, this magnificent pigment must be branded as one of the most fugitive under the action of light. Every experimenter on the permanence of water colours has found that Carmine gradually loses its richness by exposure; and under the influence of direct sunshine fades right out in a very few weeks.

Carmine is seldom employed in landscape painting; but is chiefly used in illumination and flower-painting.

Crimson Lake

Is precisely similar to Carmine in origin; and differs from it in containing a larger quantity of base and a correspondingly smaller amount of colouring matter. It is far more generally useful than Carmine, washes better, and is not so scarlet in hue.

It is a matter of regret that all we can say for this admirable pigment is that it is probably not, as usually stated, less permanent than Carmine. It is decolorized slowly under ordinary conditions of exposure, and under strong light its disappearance is rapid and complete.

Crimson Lake is one of those colours in universal use which the water-colour painter should endeavour if possible to dispense with. To Gamboge and Indigo this recommendation is in a lesser degree applicable.

Scarlet Lake

Is simply an intimate combination of Crimson Lake with Pale Vermilion, and owes its scarlet hue entirely to the presence of this latter pigment.

Scarlet Lake is even less permanent than Crimson Lake.

Madder Carmine

Is a lake prepared by precipitating the colouring matter of the madder root in combination with alumina. Like the Carmine of Cochineal, this Carmine of Madder is the strongest of a series of lakes.

Madder Carmine, by contrast with Cochineal Carmine, is a permanent colour. Indeed, observation seems to show that under the action of ordinary diffused daylight it may be classed as absolutely permanent. But it has nevertheless been convicted of fading slightly after a lengthened exposure to direct sunlight.

Madder Carmine is chiefly valued by the water-colour artist for its deep touches. In pale washes it is surpassed by Rose Madder.

Rose Madder

Is less intense than the preceding and less scarlet in hue. It is of a beautiful rose colour, leaning neither to crimson nor scarlet.

Rose Madder is, as indicated above, chiefly valued for its wash, and affords the most perfect carnation tints known. It resembles Madder Carmine in respect of permanence; years of exposure to diffused daylight have no effect upon it, and only by the prolonged action of sunlight can it be made to lose in intensity and become more purple in hue.

Pink Madder.

The original Pink Madder was originally a still weaker lake prepared from the madder root; but this is now

obsolete. Pink Madder is nowadays identical with Rose Madder.

Madder Lake

Is simply another synonym for Rose Madder.

Dragon's Blood.

Genuine Dragon's Blood is a resin brought from the East Indies; and is a warm, semi-transparent, and rather dull red, which fades by exposure to ordinary light, and is an entirely ineligible pigment. The imitative pigment now sold under the name is a semi-permanent substitute, which fades under the action of strong light to a burnt sienna colour. It is a very useful colour to architects.

ORANGE PIGMENTS.

Cadmium Orange.

A variety of sulphide of cadmium introduced in 1862. It is a very brilliant and lustrous pigment, and is much used to replace the old "Chrome Orange" as being not only more permanent, but much more mellow and beautiful in colour. It possesses a fair amount of transparency, and is simply invaluable for gorgeous sunsets.

Cadmium Orange is perfectly durable under normal conditions of exposure. By severe and lengthened exposure to sunlight it becomes slightly browner in hue. Impure air and damp have no action on it, and, altogether, it is one of the valuable colours we possess in its combination

of brilliance and permanence. To illuminators Cadmium Orange has been a most valuable acquisition.

Chrome Orange

Consists of basic chromate of lead. Like all the chromates of lead, it is marked by great power and brilliancy; but also by harshness of colour, want of permanence, and a tendency to oxidize delicate organic pigments. It may for most purposes be effectually superseded by Cadmium Orange. Chrome Orange, by reason of its lead base, is discoloured by an impure atmosphere.

Mars Orange.

A subdued orange pigment, consisting essentially of artificially prepared sesquioxide of iron. It possesses considerable transparency, and is marked by great clearness and purity of colour. Its pale washes afford bright sunny tints, and it is extremely permanent.

It has been stated that Mars Orange has a tendency to injure the more evanescent colours, such as Crimson Lake and Indigo; the artist will therefore be wise in avoiding such combinations while the question is still *sub judice.*

Burnt Sienna

Consists of calcined Raw Sienna. It is of a brown orange or orange-russet colour; and is richer, deeper, and more transparent than Raw Sienna.

Burnt Sienna is extremely permanent, and is one of our most generally useful water colours.

Neutral Orange

Was introduced by Mr. Penley, and is a pigment produced by mixing Cadmium Yellow and Venetian Red. It is recommended as a first wash, to break the extreme brilliancy of the white paper, and is made up in cakes for the convenience of the artist.

Neutral Orange is perfectly permanent.

YELLOW PIGMENTS.

Aureolin

Was introduced as a pigment by Mr. T. Salter in 1860, and is one of the most recent and valued additions to the palette. Aureolin consists of a double nitrite of cobalt and potassium, and in spite of a somewhat doubtful theoretical stability, has proved itself in practice to possess great permanence. It is a very beautiful, transparent, and delicate colour, and is stated to be the purest, in point of hue, of all our yellow pigments.

Aureolin mixes safely with most colours; but as it has been found to exert an injurious action upon Indigo, should be used cautiously with delicate organic pigments. By reason of its chemical composition it is possible for it to exert either an oxidizing or a reducing action, and this is a double source of danger.

The pale washes of Aureolin are singularly beautiful, and will resist long exposure to sunlight with scarcely

appreciable fading. Under ordinary daylight it is undoubtedly as permanent as any colour we have.

Deep Cadmium Yellow.

A lustrous, glowing, orange-yellow, which although not very transparent, is wonderfully clear and bright. It is certainly the richest and most powerful yellow we possess. Consisting of sulphide of cadmium, it is of course unaffected by impure air. Lengthened exposure to direct sunlight sometimes renders it rather browner; but in ordinary daylight it stands without change. We may therefore class Deep Cadmium among our most durable colours.

Pale Cadmium Yellow.

There are two varieties of Pale Cadmium in the market, one a full yellow, and the other far more lemon in hue; and they have very different qualifications in respect of permanence. The first-named variety is quite as permanent as the Deep Cadmium Yellow above. The latter, although varying considerably in durability according to the method of manufacture, sooner or later fades away under the action of ordinary light.

Deep Chrome Yellow

Consists of a chromate of lead, more or less basic, prepared by precipitation, and is a brilliant yellow with great covering property, but possessing in common with all the chromes a peculiar harsh and disagreeable quality of colour. Exposure to sunlight dulls it considerably; and in an impure atmosphere it is blackened.

With many pigments it cannot be mixed without producing destructive effects. This injurious action of Chrome Yellow upon some of the blues—Prussian blue, Antwerp blue, and Indigo—is quite notorious; and indeed its tendency to oxidize other substances is so well marked that any mixture of Chrome Yellow with an organic pigment should be shunned.

Pale Chrome Yellow

Consists of neutral chromate of lead, and is precisely similar to the above in properties. It is even less permanent, and acquires a greenish hue by simple exposure to ordinary daylight. As it is much more used than the Deep Chrome in admixture with blue, our remarks above apply in greater force.

Lemon Yellow.

The genuine and only permanent Lemon Yellow is a peculiar preparation of chromate of barium. It is a very beautiful semi-opaque lemon, inclining to primrose, and possessing great purity and clearness of colour, although not very remarkable for intensity.

Lemon Yellow works and washes very pleasantly, and is not changed by exposure to light if properly prepared. If, however, badly made, it becomes greenish after a time.

There is another preparation called "Lemon Yellow," often sold to artists, which is far more rich in colour, and consists of chromate of strontium. This extremely beautiful pigment is naturally unfitted for a water colour, as it is slightly soluble in water—a fatal defect for a chromate. It in consequence becomes green with very great rapidity, and

should on no account be employed. It would be well if every artist in purchasing Lemon Yellow should obtain a distinct pledge from his colourman that it is chromate of barium. Field's process for making his celebrated Lemon Yellow was purchased, at his decease, by Messrs. Winsor & Newton.

King's Yellow,

Sometimes termed Orpiment, is an artificially prepared sesquisulphide of arsenic, and usually contains an appreciable quantity of free arsenious acid. It is a bright yellow pigment, in hue about midway between Aureolin and Lemon Yellow, and with so many bad qualities that it is rapidly falling into disuse.

King's Yellow was much employed by ancient painters under the name of Auri-pigmentum, which latterly became corrupted into Orpiment. It is gradually bleached by exposure to daylight, and is a very deadly poison. The old painters were badly off for yellows, and Orpiment was the only brilliant one they possessed. Nowadays there is no excuse for its retention on the palette.

Naples Yellow,

Formerly a compound of the oxides of lead and antimony, is now a compound pigment, prepared from Cadmium Yellow and Chinese White, which closely imitates the original in colour, and possesses the advantage of perfect durability.

Naples Yellow is opaque, and possesses a pleasing pale, warm, straw colour.

Mars Yellow,

Like Mars Orange, consists of artificially prepared oxide of iron. It resembles the yellow varieties of ochre, but is more transparent, and purer, richer, and brighter in colour. It is extremely durable, but should be used cautiously with the delicate organic colours until proved to be harmless in their company.

Raw Sienna.

A natural earth of a somewhat impure yellow colour, chiefly valued for its transparency. It possesses more body than the ochres, but unless skilfully prepared is apt to work pastily, and become insuspensible. Raw Sienna bears an admirable reputation for durability.

Yellow Ochre.

A native earth coloured by sesquixode of iron, and found of very fine quality near Oxford. It is a tolerably bright yellow, quite indispensable to the landscape painter, and altogether admirable in respect of permanence.

Yellow Ochre has been stated to have an injurious effect on the lakes of Cochineal and on Intense Blue; the artist will therefore do well to avoid these mixtures until the question is definitely settled, and to content himself meanwhile with a strong improbability that the statement is correct.

Roman Ochre

Is similar to Yellow Ochre in origin and durability, and resembles it in colour. It is, however, more transparent,

and less orange in hue, and so for some purposes is often preferred.

Brown Ochre

Is similar in composition and properties to the two last pigments, and differs from them in being a deep-toned brownish yellow much valued for its density. With the other ochres it shares the distinction of great durability, and the suspicion of a possible injurious effect upon delicate colours.

Yellow Carmine.

The first of a series of three lakes prepared by precipitating the colouring matter of quercitron bark in combination with alumina. It is sometimes sold under the name of *Yellow Madder*, and has thus acquired a kind of presumptive permanence which is utterly misleading.

Yellow Carmine is a very rich, powerful, and transparent colour, and forms so admirable a glaze that its want of permanence is a disaster to water-colour art. Under the influence of ordinary daylight it is very evanescent, and by very short exposure to sunlight will fade right away.

Italian Pink

Contains more alumina and less colouring matter than the preceding, and is consequently not so rich and powerful. In other ways it is precisely similar.

Yellow Lake.

The third of this series of lakes is a still weaker preparation. It resembles Italian Pink, but is rather more lemon in hue.

Gamboge,

A gum resin imported from Ceylon, is a bright transparent yellow much in use as a water colour. It has no great depth, and in deep touches shines in an unpleasant manner, and verges on brown.

Although Gamboge is much weakened by exposure to sunlight, yet there is little doubt that, in ordinary daylight, it will stand for many years without serious alteration. Although by itself it is of doubtful permanence, it has the admirable property, when used as a glaze, of protecting delicate pigments, and thus one must hesitate in recommending the artist to dispense with its services.

Indian Yellow,

A pigment long employed in India under the name of "Purree," consists essentially of euxanthate of magnesium, and is obtained from the urine of the camel. It possesses a beautiful pure yellow colour of much greater body and depth than Gamboge.

As a water colour Indian Yellow has a somewhat varying reputation for durability; but there is not the slightest doubt that the best samples are extremely permanent. It has been exposed to direct sunlight for two or three years without any appreciable change—a far more severe test than any the artist need demand.

It has been stated to be not without action on Carmine and Crimson Lake, perhaps on account of a slight alkaline reaction. Mixtures of Indian Yellow with these pigments it is therefore well to avoid.

Gallstone.

True Gallstone is an extremely rich, deep-toned, and gorgeous yellow, prepared from a calculus in the gall-bladder of oxen. It is, however, too fugitive to merit much attention, fading away rapidly by exposure to light, and is moreover so difficult to obtain in any quantity, that it is usually replaced by an imitative substitute—often nothing more nor less than Yellow Carmine.

GREEN PIGMENTS.

Oxide of Chromium

Is artificially prepared by a dry process, and consists of the anhydrous sesquioxide. It is one of the most permanent pigments we possess.

Oxide of Chromium is a cold, sober sage green, deep-toned and opaque. Although dull, the quality of colour is very agreeable, and the tints with white are very delicate and pleasing.

Oxide of Chromium washes somewhat indifferently, and, being a very dense and powerful colour, must be employed with caution to avoid heaviness of effect.

Viridian,

Or *French Veronese Green*, differs from the above pigment in being a hydrated instead of an anhydrous sesquioxide of chromium, and in being transparent instead of opaque. It is extremely permanent.

Viridian is a bluish green, possessing great depth of colour. In its pale washes it is unsurpassed for clearness. No mixture of blue and yellow pigments will afford a green so beautiful and stable.

Emerald Green

Consists of aceto-arsenite of copper prepared by precipitation, and is the most durable of all the greens with a copper base. It is an extremely vivid colour, which is durable under exposure to light, but has a tendency to darken in an impure atmosphere.

Where Emerald Green is required no mixture of blue and yellow will serve as a substitute. It works rather badly, and must not be mixed with any of the Yellows of Cadmium.

Hooker's Green

Is a mixed pigment, consisting of an intimate combination of Prussian Blue and Gamboge, and is a very transparent and serviceable colour.

Hooker's Green has precisely the permanence which might be expected of its constituents. It is prepared of two hues, known respectively as Hooker's Green No. 1 and Hooker's Green No. 2.

Prussian Green

Resembles the preceding pigment in being a compound of Prussian Blue and Gamboge, but contains a very large excess of the former pigment. It is in consequence a very bluish green, possessing extreme depth and transparency. As with Hooker's Green, we can only claim for it, on the

score of permanence, that it is not more fugitive than either of its constituents.

Sap Green

Was originally a vegetable pigment prepared from the juice of buckthorn berries, which, besides being fugitive, was very hygroscopic, and consequently apt to get mildewed. The pigment now sold under the name is an imitative green lake prepared from Yellow Lake and Prussian Blue. It is an extremely transparent yellowish green, and is principally valued by the flower-painter.

Sap Green does not resist prolonged exposure to ordinary daylight, and is by no means an eligible pigment.

Terre Verte.

A natural earth of a sober bluish-green hue, and deriving its colour from the presence of protoxide of iron. It is not very bright or powerful, but is a very durable pigment.

Terre Verte is semi-transparent, and mixes safely with other colours. It is one of the most ancient of pigments.

BLUE PIGMENTS.

Genuine Ultramarine

Is prepared from *lapis lazuli*, a stone found in many parts of Asia, and is the most costly and celebrated of all pigments.

Genuine Ultramarine is isolated from the stone by a very ingenious and tedious mechanical process. The crushed mineral is mixed with resinous matter into a thick paste,

which is then washed with water to separate the Ultramarine. The principle of the method seems to be that the resinous paste has less attraction for the particles of Ultramarine than for those of the stony matrix. The first portions of Ultramarine which separate are the deepest and richest, and constitute the pigment under notice. The next portions are of a bluish-gray colour, and furnish the pigment called *Ultramarine Ash*.

Genuine Ultramarine, when skilfully prepared, is an exquisitely beautiful blue, by far the purest we possess. In the representation of sky and atmosphere it has no rival, but, unfortunately, it washes very badly.

Genuine Ultramarine is eminently durable under all ordinary conditions of exposure, but should be carefully guarded from the acid atmosphere of modern towns.

French Blue,

Or *French Ultramarine*, is an artificial imitation of genuine Ultramarine, and presents a more or less near approach to the latter, according to the skill employed in its manufacture.

The best French Ultramarines are usually darker and less azure than the genuine variety, but the superiority of the latter consists not so much in its greater purity of colour—although this is considerable—as in its far greater transparency.

French Blue is a perfectly permanent pigment, and, possessing in a subdued degree the qualities of genuine Ultramarine, it furnishes a generally useful substitute, especially as its washing properties are superior.

New Blue.

A pale variety of French Ultramarine, possessing precisely similar properties. It is a very good and inexpensive substitute for Cobalt.

Cobalt Blue.

Prepared artificially by calcining a mixture of alumina and basic phosphate of cobalt. It was discovered in 1802 by M. Thenard.

Cobalt Blue does not possess the depth and transparency of genuine Ultramarine, but washes far better. The best specimens are of a beautiful azure colour. Although unaltered under the most severe exposure to light, Cobalt is apt to become greener in hue in an impure atmosphere.

Cerulean Blue,

Or *Cæruleum,* is a compound of the oxides of tin and cobalt, prepared artificially by a dry process. It is a comparatively new pigment, and has the distinctive property of appearing a fairly pure blue by artificial light, tending neither to green on the one hand nor to purple on the other.

In other respects Cerulean Blue has no very striking artistic properties. By daylight it is a light greenish-gray blue with little depth or richness of colour. Unless used with caution, it is apt to produce a chalky effect, and it washes in a very indifferent manner.

Cerulean Blue has a very good reputation for permanence under exposure to light, but, like Cobalt, has a tendency to

discolour in an impure atmosphere. For scene-painting it is admirably adapted.

Smalt,

Discovered about 1540, is an artificial pigment, and in fact consists of glass coloured an intense blue by oxide of cobalt and then ground until a powder of the proper hue is obtained.

Smalt is gritty in texture, and in consequence washes very badly. It is not affected by exposure to light, but is apt, by disintegrating under the action of atmospheric moisture, to lose its beauty of colour, and is discoloured by an impure atmosphere. It is chiefly valued for flower-painting and illumination.

Prussian Blue,

Discovered in 1710 at Berlin, consists essentially of ferrocyanide of iron prepared by precipitation. It is a colour of immense body, transparency, and richness of colour; and its deep washes are so intense as to appear black.

Prussian Blue has a very decided green tendency, and consequently cannot be used effectively in skies and distances. Although it cannot be called permanent, yet it is by no means a fugitive colour. Exposed to ordinary daylight it has been found to stand extremely well; but in sunshine it fades to some extent. Much depends on the mode of its manufacture.

Prussian Blue loses its beauty of colour in an impure atmosphere, and is discoloured by exposure to damp.

Antwerp Blue

Is a paler and less permanent variety of Prussian Blue containing a large quantity of alumina.

Leitch's Blue,

Or *Cyanine Blue*, is a compound of Cobalt Blue and Prussian Blue, and possesses properties which would be expected of a mixture of these two pigments. It has been found very durable under fairly severe exposure to light.

Indigo,

The *Indian Blue* of the ancients, is prepared from the leaves of the *Indigofera* plant. It is similar in hue to Prussian Blue, but is much darker in tone. Although not nearly so rich as Prussian Blue, it approaches it in depth and transparency of colour.

Indigo works and washes admirably, but is unfortunately not a very durable pigment. Under ordinary diffused daylight it has been found to stand well; but much undoubtedly depends on the method of preparation of the particular sample. All varieties are fugitive by exposure to the direct rays of the sun.

Intense Blue

Consists of Indigo refined by solution and re-precipitation. It is thus said to be rendered more durable, and is certainly rendered much more deep and powerful. It is in other respects similar to Indigo; but possesses the disadvantage of penetrating the paper on which it is employed.

PURPLE PIGMENTS.

Purple Madder,

A lake prepared from the madder plant, is the only durable purple pigment. It is of a marone-purple colour, marked by subdued richness rather than by brilliancy, and possessing great transparency. It is extremely useful to the water-colour painter, as it affords the greatest depth of shadow without coldness of hue.

Purple Madder is practically permanent under ordinary conditions of illumination; and resists direct sunlight for a long time without fading, although eventually it has been found to do so. It is the most permanent of all the madders.

Purple Lake

Is a species of Crimson Lake with a purple cast. It is transparent, has great depth, and is a very useful shadow colour. In general properties it is similar to Crimson Lake, but is rather more durable.

Burnt Carmine,

Obtained by partially charring Carmine, is a magnificent reddish purple of extreme richness and depth. It is said to be not more permanent than ordinary Carmine.

Indian Purple.

Prepared by precipitating the colouring matter of a decoction of cochineal on a base of oxide of copper. A

very deep-toned but rather cold and subdued purple, apt to blacken under ordinary conditions of exposure.

Violet Carmine,

Prepared from the root of the *Anchusa tinctoria*, is a brilliant bluish purple possessing much richness of colour. On exposure to light it loses its colour and blackens.

Mauve.

A lake prepared from aniline, which should only be used for temporary purposes It is by exposure to ordinary daylight by far the most fleeting of all our modern water colours, and should be utterly shunned by the landscape painter.

BROWN PIGMENTS.

Brown Madder,

A lake prepared from the madder root, is an exceedingly rich marone-brown possessing great transparency and depth of colour. It works very pleasantly, and is so useful for shadows as to be nearly indispensable to the water-colour painter.

It is practically permanent in ordinary daylight, but by exposure to sunshine often undergoes considerable changes. In fact, under the action of direct sunshine, it is the least permanent of the madder colours.

Rubens' Madder

Is also a preparation of the madder root, and is brighter and more russet in hue than the preceding. In general

properties it resembles the above pigment, and like all the madder colours, is practically permanent under exposure to diffused daylight.

Bistre,

Prepared from the soot of wood fires, is a powerful citrine-brown, with a clearness about it suited to architectural subjects. It is durable under ordinary conditions, but has been observed to fade considerably by exposure to sunlight.

Burnt Umber

Is made by calcining Raw Umber; the raw earth thus acquires a deeper tone and more russet hue. Burnt Umber works and washes well, and is admirably durable under all conditions of exposure.

Vandyke Brown,

Prepared from a bituminous ochre, is a fine, deep, and semi-transparent brown. The most celebrated variety comes from Cassel. It varies a great deal in hue and in reputation for permanence. It is probably durable under ordinary conditions, but fades in sunlight and becomes grayer in colour.

Vandyke Brown has an awkward habit of "washing up"; and when it is necessary to lay on a large body of colour, the moist tube colour should be used in preference to the cake.

Cologne Earth

Originally was a native bituminous earth; but the modern pigment is obtained by calcining Vandyke Brown, and a

product closely resembling the Old Cologne Earth but of greater durability, is thus obtained.

Sepia,

Obtained from a secretion of the cuttle-fish, *Sepia Officinalis*, is a powerful dusky brown of extremely fine texture. It is transparent and practically durable if kept from strong light. On exposure to sunshine it fades very perceptibly.

Sepia possesses extremely clear pale tints, and is the best washing pigment with which the water-colour artist is acquainted.

Warm Sepia

Is the natural Sepia warmed by mixing it with browns of a red hue.

Roman Sepia

Is also produced by admixture, but has a yellow instead of a red tendency.

CITRINE AND OLIVE PIGMENTS.

Brown Pink,

Originally a lake prepared from Persian Berries, is now largely replaced by a product of quercitron bark.

In the former case the product is inferior in stability to that obtained from the latter source.

Brown Pink is a fine citrine colour with much richness and transparency. It works fairly well, and has a varying reputation for permanence, depending both upon its composition and probably also upon the intensity of light to which it has been subjected. Both varieties are undoubtedly fugitive

under the direct rays of the sun, and especially the colour obtained from the berries. There seems, however, to be evidence that both varieties are fairly durable under exposure to carefully moderated daylight.

Raw Umber.

A natural ochre owing its colour to the presence of the hydrated oxides of iron and manganese. The finest variety comes from Cyprus, and is termed "Turkish" or "Levant Umber."

Raw Umber possesses a fine brownish citrine colour, is semi-opaque, and has a tendency to darken in time. Under ordinary conditions it is otherwise durable; but in direct sunlight it has been found to fade slightly after lengthened exposure.

Olive Green,

Or *Dewint's Green*, is a mixed pigment of a fine deep olive colour and sober richness.

Like many other compound pigments, it is more or less permanent according to the ingredients of which it is composed. Generally speaking it is more beautiful than durable. All the varieties of Olive Green are destroyed by direct sunlight. With respect to its durability under exposure to moderate daylight there is reason to believe that at least some varieties stand very well. Messrs. Winsor & Newton's Olive Green is an intimate combination of Indian Yellow and Indigo.

GRAY PIGMENTS.

Ultramarine Ash.

Prepared from the *lapis lazuli* after the richer blue has been extracted. It is a valuable pale azure-gray colour, varying somewhat in intensity, but always unvarying in permanence.

Ultramarine Ash washes much better than genuine ultramarine, and is very useful in obtaining delicate atmospheric effects.

Neutral Tint.

A compound shadow-colour of a cool neutral character. It is not very permanent, as the gray is apt to become grey by exposure. This change may be prevented by a slight addition of Ultramarine Ash.

Payne's Gray

Is a similar compound pigment. It is more lilac in hue, but otherwise resembles Neutral Tint in properties.

BLACK PIGMENTS.

Ivory Black

Is obtained by charring ivory, and is the richest and most transparent black on the palette.

Ivory Black, when properly made, is extremely durable. It has a tendency to brown in its pale washes.

Lamp Black

Is prepared from the soot of burning resinous matter, and is a black of very fine texture and great covering power. Although in transparency and intensity inferior to Ivory Black, it is much less brown in pale washes.

Lamp Black should be used with caution, or its density is apt to induce a heavy effect.

Blue Black,

Prepared by calcining vine twigs, is perhaps the most useful black for landscape painting. It has less density than either of the foregoing pigments, and is thus especially serviceable where a sooty effect is to be avoided.

APPENDIX

ON

"LIGHT AND WATER-COLOURS."

The *Water-Colour Controversy* was carried on by means of:—

(1.) A series of forty-eight letters to the *Times*, dating from March 11 to September 27, 1886. (These, with two *Times* leaders on the subject, have been reprinted in pamphlet form by Mr. Parnell, 63, Southampton Row, W.C.)

(2.) Two articles in the *Nineteenth Century*, by Mr. J. C. Robinson and Mr. Frank Dillon, R.I., and occurring in the numbers for June and August, 1886.

In the following publications the controversy has been referred to:—

i. Catalogue of Old Water-Colour Drawings exhibited in July, 1886, by the Royal Institute of Painters in Water Colours. This contains a preface by Sir James Linton and an appendix by Professor Ruskin on the subject

ii. Article in the *Daily News*, August 17, 1886.

iii. Paper by Professor Hartley, F.R.S., on the Fading of Water Colours, read before the British Association, and published in the *Chemical News* for November 26, 1886.

iv. Lecture on the English Water Colour School, delivered before the Society of Arts, March 31, 1887, by Mr. James Orrock, R.I., and since republished in the form of a pamphlet.

RESULTS OBTAINED BY EXPERIMENTERS ON THE ACTION OF LIGHT ON WATER COLOURS.

(1.) Results obtained by Mr. Simpson, R.I., after exposure for 15 YEARS to sunshine and full daylight in a window casement (published in a letter to the *Times*) :—

Unchanged.	Yellow Ochre. Lemon Yellow. Permanent Yellow (Newman). Burnt Sienna. Vandyke Brown. Burnt Umber. Bistre. Light Red. Vermilion. Indian Red. Prussian Blue. Cobalt. Cyanine Blue (Leitch's Blue). Ultramarine. Azure (Newman). Lamp Black.
Unfaded but slightly changed in hue.	Cadmium Yellow. Brown Madder. Rose Madder. Purple Madder.
Very slightly faded	Emerald Green. Sepia. Roman Sepia. French Blue.
Considerably faded.	Indian Yellow. Gamboge. Chrome Yellow. Brown Pink.
Faded right out.	Indigo. Crimson Lake. Carmine.

(2.) Results obtained by Professor Rood, of Columbia College, after exposure for $3\frac{1}{2}$ MONTHS to summer sunshine (published in 'Modern Chromatics,' p. 90):—

Indian Red. Light Red. Mars Orange. Cadmium Yellow. Yellow Ochre. Roman Ochre. Terre Verte. Cobalt. French Blue. Smalt. New Blue. Burnt Umber. Burnt Sienna.	Unchanged.

The following pigments were all more or less affected. Those that were very little changed head the list, which is arranged so as to indicate the relative amounts of damage suffered, the most fugitive colours being placed at its end:—

Chrome Yellow becomes slightly greenish.
Red Lead becomes slightly less orange.
Naples Yellow becomes slightly greenish brown.
Raw Sienna fades slightly; becomes more yellowish.
Vermilion becomes darker and brownish.
Aureolin fades slightly.
Indian Yellow fades slightly.
Antwerp Blue fades slightly.
Emerald Green fades slightly.
Olive Green fades slightly; becomes more brownish.
Rose Madder fades slightly; becomes more purplish.
Sepia fades slightly.
Prussian Blue fades somewhat.
Hooker's Green becomes more bluish.
Gamboge fades, and becomes more grey.
Bistre fades, and becomes more grey.
Brown Madder fades somewhat.
Neutral Tint fades somewhat.
Vandyke Brown fades, and becomes more grey.
Indigo fades somewhat.

Brown Pink fades greatly.
Violet Carmine fades greatly ; becomes brownish.
Yellow Lake fades greatly ; becomes brownish.
Crimson Lake fades out.
Carmine fades out.

Results obtained by Professor Hartley, F.R.S., after exposure for 14 DAYS, for 6 hours a day, to air and sunlight (published in No. 1409 of the *Chemical News*) :—

Vermilion.	Unchanged.
Indian Red.	
Light Red.	
Cadmium Orange.	
Cadmium Yellow.	
Indian Yellow.	
Yellow Ochre.	
Ultramarine.	
Indigo.	
Cobalt.	
Emerald Green.	
Viridian.	

Sepia does not fade, but becomes colder in hue.
Brown Madder. Slightly lighter after eight days.
Brown Pink becomes lighter and browner in one day.
Olive Green becomes lighter and bluer in one day.
Bistre becomes lighter in one day.
Gamboge. Light washes bleached in three days (eighteen hours). Strong washes fade greatly in a week, and even three hours' exposure produces a perceptible effect.
Crimson Lake. Light washes almost bleached in one day. Dark washes fade greatly in three days.

NOTES ON THE PLATES.

Notes on the List of Colours.—These plates contain a gradated wash of every Water Colour in general use with the exception of Chinese White.

Chinese White is so well known, and in such universal use, and can moreover be shown to such small advantage on a white background, that it was decided not to include it with the other washes, especially as it fell in kindly with no colour arrangement.

Note on the Colour Arrangement.—It is not usually attempted in albums of colours to place similar hues together, on account of the dull effect that is produced by their juxtaposition; but it is preferred to give to them any arbitrary arrangement which may produce good contrasts, and make each pigment look its best.

The advantages, however, of the unarbitrary method of placing similar colours in contiguity, are, for purposes of utility, so well marked, that the author decided to adopt it, and he has endeavoured to redeem the method by gradation of hue, and (as far as was possible with fixed spaces and a fixed list of pigments) by contrasting rows, instead of individual colours.

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Burnt Sienna
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Charcoal Gray
Chinese White
Chrome Lemon
Chrome Yellow
Chrome Deep
Chrome Orange
Cologne Earth
*Constant White
§Davy's Gray
Dragons' Blood
Emerald Green
Flake White
Gamboge
Hooker's Green, No. 1
Hooker's Green, No. 2
Indian Red
Indigo
Italian Pink
Ivory Black
‡Kings' Yellow
Lamp Black
Light Red
†Mauve
Naples Yellow
Neutral Tint
New Blue
Olive Green
Payne's Gray
Permanent Blue
Prussian Blue
Prussian Green
Raw Sienna
§Raw Sienna, pale
Raw Umber
Roman Ochre
Sap Green
Terre Verte
Vandyke Brown
Venetian Red
Vermilion
Yellow Lake
Yellow Ochre

* Prepared only in Cakes and Half Cakes.
‡ Not prepared in Tubes and Half Tubes.
† Not prepared in Cakes and Half Cakes.
§ Prepared only in Tubes and Half Tubes

Whole Cakes, Pans, or Tubes, 1/6 each.
Half Cakes, Pans, or Tubes, 9d. each.

†Alizarin Carmine	Mars Yellow
Alizarin Crimson	Neutral Orange
Alizarin Green	Orange Vermilion
Alizarin Orange	Purple Lake
Alizarin Scarlet	Roman Sepia
Alizarin Yellow	Rose Madder (Alizarin)
*Black Lead	Rubens' Madder
Brown Madder	Ruby Madder (Alizarin)
Carmine Lake	Scarlet Lake
Cerulean Blue	Scarlet Madder (Alizarin
Crimson Lake	Scarlet Vermilion
Indian Yellow	Sepia
Leitch's Blue (Cyanine Blue)	Warm Sepia

Whole Cakes, Pans, or Tubes, 2/- each.
Half Cakes, Pans, or Tubes, 1/- each.

Cadmium Lemon	Lemon Yellow
Cadmium Yellow, Extra Pale	Mars Orange
Cadmium Yellow, Pale	Mineral Violet
Cadmium Yellow	Orient Yellow
Cadmium Yellow, Middle	Oxide of Chromium
Cadmium Orange	†Oxide of Chromium Transparent
Cobalt Blue	
Cobalt Green	Permanent Mauve
Cobalt Violet	Permanent Violet
†Emerald Oxide of Chromium	Pure Scarlet
French Blue (French Ultramarine)	†Ultramarine Ash, Gray
Indian Purple	Violet Carmine
Intense Blue	Viridian (Veronese Green)

Whole Cakes, Pans, or Tubes, 3/- each.
Half Cakes, Pans, or Tubes, 1/6 each.

Aureolin	New Olive Green
Aurora Yellow	Pink Madder
Burnt Carmine	Primrose Aureolin
Carmine	Purple Madder
Cobalt Yellow	Rose Doré
Field's Orange Vermilion	Rose Madder
Gallstone	†Rose Madder (Pink Shade)
Madder Carmine	Scarlet Madder
Madder Lake	‡Yellow Carmine

‡—This colour is sometimes sold under the name of Yellow Madder.

Whole Cakes, Pans, or Tubes, 5/- each.
Half Cakes, Pans, or Tubes, 2/6 each.

Smalt	Ultramarine Ash, Blue

Wholle Cakes, **21/-;** Half Cakes, **10/6;** Quarter Cakes, **5/6** each.
Genuine Ultramarine.

* Prepared only in Cakes and Half Cakes. †—Not Prepared in Cakes and Half Cakes.

WINSOR & NEWTON'S

Polished Mahogany Boxes,

FITTED WITH

WHOLE AND HALF CAKE WATER COLOURS.

"Sliding Lid" Mahogany Boxes.

	Whole Cake Colours. £ s. d.	Half Cake Colours. £ s. d.
Box containing 6 Colours with Brushes	0 6 0	0 4 0
Ditto 12 ditto	0 12 0	0 6 6
Ditto 18 ditto	0 18 0	0 9 6
Ditto 24 ditto	1 4 0	0 12 6

"Lock" Mahogany Boxes.

	£ s. d.	£ s. d.
Box containing 12 Colours, with Brushes and other fittings	0 15 0	0 9 0
Ditto 18 ditto	1 1 0	0 12 0
Ditto 24 ditto	1 10 0	0 18 0

"Lock and Drawer" Mahogany Boxes.

	£ s. d.	£ s. d.
Box containing 12 Colours, with Brushes and other fittings	0 18 0	0 12 0
Ditto 18 ditto	1 5 0	0 15 0
Ditto 24 ditto	1 15 0	1 1 0

"Complete" Mahogany Boxes.

	£ s. d.	£ s. d.
Box containing 12 Colours, with Brushes and other fittings	1 1 0	0 14 0
Ditto 18 ditto	1 11 6	0 18 0
Ditto 24 ditto	2 2 0	1 5 0

"Caddy Lid" Mahogany Boxes.

	£ s. d.	£ s. d.
Box containing 12 Colours, with Brushes and superior fittings	1 11 6	1 0 0
Ditto 18 ditto	2 2 0	1 5 0
Ditto 24 ditto	3 3 0	1 11 6

"Superior Caddy Lid" Polished Spanish Mahogany Boxes.

12 Cake, £2 12*s.* 6*d.*; 18 Cake, £3 3*s.*; 24 Cake, £4 14*s.* 6*d.*

"Handsome" Caddy Lid and "Extra Handsome" Polished Spanish Mahogany Boxes.

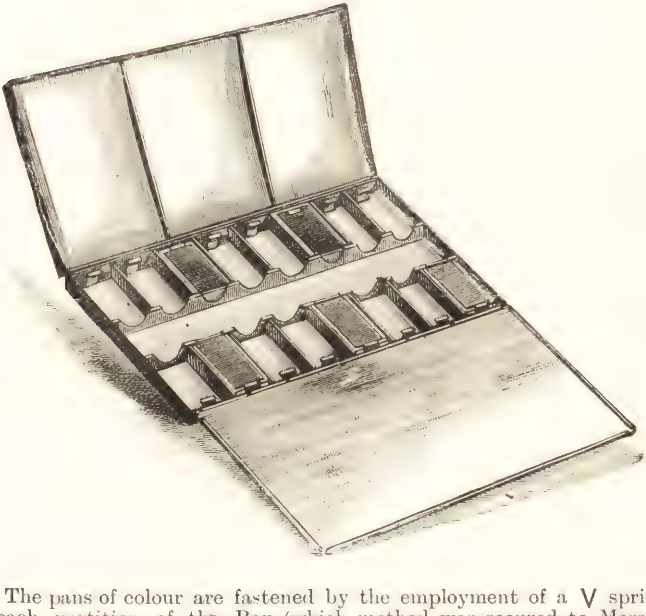
£3 13*s.* 6*d.* to £21.

WINSOR & NEWTON'S

"Patent Spring" Japanned Tin Boxes,

FITTED WITH

MOIST WATER COLOURS IN CHINA PANS.



The pans of colour are fastened by the employment of a V spring in each partition of the Box (which method was secured to Messrs. Winsor & Newton, Limited, under Letters Patent in Great Britain, the principal Kingdoms in Europe, and in the United States of America); they are thus held firmly, and the long-felt inconvenience of cementing the china pans *to the box*, and of removing them when empty is avoided.

The improvement is a valuable one to Artists, as any colours in a box can be at once changed to suit their requirements, and the pans can be moved from one position to another at pleasure.

WINSOR & NEWTON'S

"Patent Spring" Japanned Tin Boxes.

With or without MOIST WATER COLOURS,

IN WHOLE PANS.

	With Colours. £ s. d.	Without Colours. £ s. d.
3 Whole Pan Box	0 6 6	0 3 0
4 ,, ,, ,, ...	0 8 3	0 3 6
6 ,, ,, ,, ...	0 10 3	0 3 9
8 ,, ,, ,, ...	0 13 6	0 4 0
10 ,, ,, ,, ...	0 16 0	0 5 0
12 ,, ,, ,, ...	0 18 6	0 5 3
14 ,, ,, ,, ...	1 1 9	0 5 6
16 ,, ,, ,, ...	1 7 0	0 6 0
18 ,, ,, ,, ...	1 10 6	0 6 6
20 ,, ,, ,, ...	1 13 0	0 6 9
24 ,, ,, ,, ...	2 2 0	0 7 6

IN HALF PANS.

	With Colours. £ s. d.	Without Colours. £ s. d.
6 Half Pan Box	0 6 9	0 3 6
8 ,, ,, ,, ...	0 8 6	0 3 9
10 ,, ,, ,, ...	0 10 0	0 4 6
12 ,, ,, ,, ...	0 11 9	0 5 0
14 ,, ,, ,, ...	0 13 0	0 5 3
16 ,, ,, ,, ...	0 15 0	0 5 6
18 ,, ,, ,, ...	0 17 6	0 6 0
20 ,, ,, ,, ...	1 0 0	0 6 6
24 ,, ,, ,, ...	1 4 0	0 7 0

The "Turner" Water Colour Sketching Boxes.

These Boxes are intended primarily for outdoor sketching, and have been designed in such a way that, when fitted, they contain all the colours and materials necessary for outdoor work. The lid contains a Sketch Block of Whatman's Thick Drawing Paper, securely held in position by a spring, and is so constructed as to allow of the Block being reversed when not in use.

	EACH. s.	d.
No. 1.—Japanned Tin Box, 7¼ by 5 in., containing 10 Half Pans of Moist Water Colours, a 7 by 5 Block of Whatman's Thick Paper, a Japanned Tin Water Bottle and Cup, Brush Holder, and a piece of Artist's Sponge	14	6
No. 2.—Japanned Tin Box, 9¼ by 5½ in., containing 16 Half Pans of Moist Water Colours, a 9 by 5½ Block of Whatman's Thick Paper, a Japanned Tin Water Bottle and Cup, Brush Holder, and a piece of Artist's Sponge	22	6
No. 3.—Japanned Tin Box, 10½ by 7 in., containing 6 Whole Pans and 12 Half Pans of Moist Water Colours, a 10 by 7 Block of Whatman's Thick Paper, a Japanned Tin Water Bottle and Cup, Brush Holder, and a piece of Artist's Sponge...	30	0

The above Boxes, with Water Bottle, Cup and Brush Holder only.

No. 1	8	0
No. 2	11	0
No. 3	13	6

Gunter's Sketcher's Hold=All.

(*REGISTERED.*)

This case of Brown Waterproof Canvas, designed by Lt.-Col. Gunter, contains in a compact compass all requisite materials for Water Colour Sketching. It can be readily strapped to the Easel, Stool or Cycle, or carried in the hand, without inconvenience; whilst its form affords complete waterproof protection to the contents.

The case contains a 16 Half Pan Japanned Tin Box of Winsor & Newton's Moist Water Colours, a Tube of Chinese White, a Water Bottle and Cups, Drawing Pencils, Knife, Sponge and Rubber, and a good selection of Sable and other Brushes.

Size, closed, 9 inches by 5½ inches.

	s.	d.
Fitted complete	31	6
The case only	6	0

WINSOR & NEWTON'S

Liquid Water Colours and Mediums.

IN SIXPENNY AND SHILLING BOTTLES.

Shilling Bottle (Half Scale).

Asphaltum
Carmine
Crimson Lake
Gold Ink
GENERAL DRAWING INK
Indelible Brown Ink
INDIAN INK
Lamp Black
Ox Gall, Colourless
Prout's Brown
Prussian Blue
Sepia
Silver Ink
Vermilion

Albanine, Process Black — Modern Pigments, for use in Black and White drawings intended for process reproduction. In special wide-mouth Bottles, large size 1s. ; small size 6d.

CHINESE WHITE.—Small Bottles or Tubes, 6d. each.
Large Bottles, Pots, or Tubes, 1s. each.
Extra Large Bottles, Pots, or Tubes, 2s. each.

Liquid Graphite.—Large Bottles, 6d.

Ox Gall (in paste form).—Large Pots, 1s. Small Pots, 6d.

Artist's Gum Water.—Large Bottles, 1s. Small Bottles, 6d.

WINSOR & NEWTON'S

Waterproof DRAWING INKS.

FOR ARCHITECTS, DESIGNERS, &c.

SIZE OF SMALL BOTTLES.

SIZE OF 1 OZ. BOTTLES.

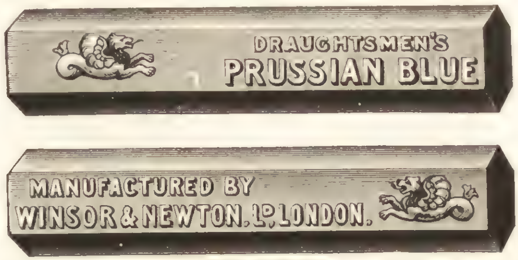
BLACK (Indian Ink) and 24 Colours, viz. :—

Brick Red, Brown, Burnt Sienna, Carmine, Emerald, Grass Green, Indigo, Lemon, Olive Green, Orange, Payne's Gray, Pink, Plum, Prussian Blue, Purple, Scarlet, Sea Green, Sepia, Slate, Turquoise Ultramarine, Vermilion, Violet, and Yellow.

	s.	*d.*			*s.*	*d.*	
Small Bottles	0	6	each.	8 oz. Bottles	6	0	each.
1 oz. ,, ...	1	0	,,	16 oz. ,, ...	11	0	,,
4 oz. ,, ...	3	6	,,				

Specimen Card of Tints on application.

HEXAGON CAKE WATER COLOURS.



SIZE OF CAKES.

For use in Draughtsmen's, Engineers', and Railway Offices.

1*s.* 6*d.* each.

Burnt Sienna	Indigo	Steel
Burnt Umber	Intense Brown	Ultramarine
Chrome Yellow	Lamp Black	Vandyke Brown
Emerald Green	Neutral Tint	Venetian Red
Gamboge	Payne's Gray	Vermilion
Hooker's Green	Prussian Blue	Yellow Ochre
Indian Red	Raw Sienna	

3*s.* each.

Crimson Lake | Indian Yellow | Scarlet Lake | Sepia

4*s.* each.—Cobalt | 6*s.* each.—Carmine

Fine Powder Colours,

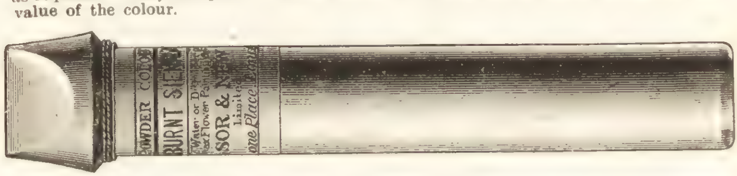
CAREFULLY LEVIGATED AND PREPARED,

ADAPTED FOR

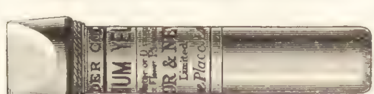
DECORATIVE PAINTING, ILLUMINATING, PICTURE RESTORING, ETC.

Stationers' Note Paper and other Relief Stamping, Colour Printing, etc.

These Colours can be mixed with either Varnish, Gum Water, Size, Oil, or Turpentine, as required. They are put into glass Bottles of different sizes, in accordance with the value of the colour.



SIZE OF THE LARGEST BOTTLE.



SIZE OF THE SMALLEST BOTTLE.

ALL COLOURS, PRICE 6d. EACH.

WINSOR & NEWTON'S

Artists' Oil Colours.

THE world-wide circulation which has long been a distinguishing feature of WINSOR & NEWTON'S OIL COLOURS testifies convincingly to the repute in which they are held, and renders a description of their characteristics somewhat superfluous. In the production of these colours no pains or expense is spared to insure that the pigments used are the most brilliant and durable that can be manufactured, and that the oils in which the pigments are ground are of the purest and most perfect quality.

Grinding colours by machinery was first introduced by WINSOR & NEWTON in 1840, special apparatus being invented by them for the purpose. Since that period many further improvements have been made in the original Mills; and it is believed that at present there exists no machinery which, for power and precision, combined with great cleanliness in working, can at all compare with that invented, perfected, and now used by them in the production of their *Artists' Oil Colours.*

Exhaustive tests which are constantly being made at the NORTH LONDON COLOUR WORKS, in which WINSOR & NEWTON'S OIL COLOURS are examined in conjunction with those of other makers, invariably establish the fact that, alike in *power and brilliancy of Colour*, *perfection of grinding*, *excellence of consistency*, and most important of all—in *durability under varying* conditions, WINSOR & NEWTON'S OIL COLOURS occupy a pre-eminent position.

WINSOR & NEWTON'S

Finely Prepared Oil Colours,

IN COLLAPSIBLE TUBES.

(*The Illustrations are the sizes of the Tubes.*)

2-INCH TUBE.

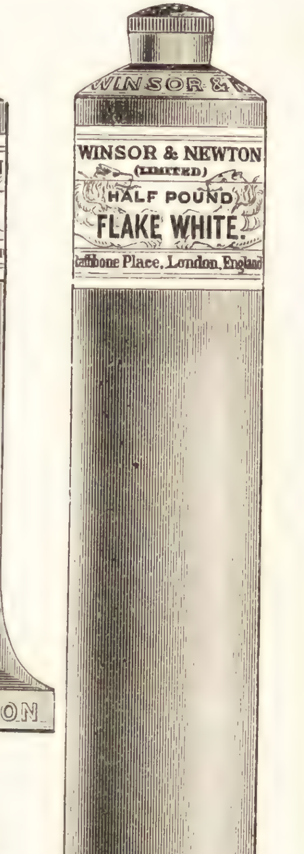
4-INCH TUBE.

DOUBLE TUBE.

A List of the Colours and the Prices follow on pages 18 and 19.

"SMALL STUDIO" Tube.

"STUDIO" Tube.



$\frac{1}{2}$-LB. TUBE OF FLAKE WHITE.

For the convenience of Artists using large quantities of Colour, all Messrs. Winsor and Newton's Oil Colours are supplied in "**SMALL STUDIO**" and "**STUDIO**" Tubes, containing respectively **FOUR TIMES** and **SIX TIMES** as much as an ordinary two-inch Tube.

Finely Prepared Oil Colours,

IN COLLAPSIBLE TUBES.

Four-inch tubes, 4d. each;

"Small Studio" Tubes, containing two four-inch Tubes, **8d. each;**
"Studio" Tubes, containing three four-inch Tubes, **11d. each.**

Antwerp Blue
Asphaltum
Bitumen
Black Lead
Blue Black
Bone Brown
Brown Ochre
Brown Pink
Burnt Roman Ochre
Burnt Sienna
Burnt Umber
Caledonian Brown
Cassel Earth
Charcoal Gray
Chinese Blue
Chrome Green, No. 1
Chrome Green, No. 2
Chrome Green, No. 3
Chrome Lemon
Chrome Yellow
Chrome Deep
Chrome Orange
Cinnabar Green, Pale
Cinnabar Green, Light
Cinnabar Green, Olive
Cinnabar Green, M'dle
Cinnabar Green, Deep
Cologne Earth
Cool Roman Ochre
Copal Megilp
Cork Black
Cremnitz White
Davy's Gray
Emerald Green
Flake White, No. 1
Flake White, No. 2
Gold Ochre
Indian Red
Indigo
Italian Pink
Ivory Black
Jaune Brillant
Kings' Yellow
Lamp Black
Light Red
Medium (Copal Megilp)
Megilp
Monochrome Tints, Cool, Nos. 1, 2, 3
Monochrome Tints, Warm, Nos. 1, 2, 3
Naples Yellow, French
Naples Yellow
Neutral Tint
Oxford Ochre
Payne's Gray
Permanent White (Zinc)
Prussian Blue
Prussian Brown
Prussian Green
Pyne's Megilp
Raw Sienna
Raw Sienna, Pale
Raw Umber
Roman Ochre
Silver White
Sugar of Lead
Terra Rosa
Terre Verte
Terre Verte, Olive Shade
Transparent Gold Ochre
Vandyke Brown
Venetian Red
Verona Brown
Yellow Lake
Yellow Ochre
Yellow Ochre, Pale
Zinc White

Two-inch tubes, 4d. each.

"Small Studio" Tubes, containing four two-inch Tubes, **1/4 each;**
"Studio" Tubes, containing six two-inch Tubes, **1/10 each.**

Cappagh Brown
Chrome Red
Crimson Lake
Cyprus Umber
Gamboge
Indian Lake
Magenta
Mauve
Mauve No. 2
New Blue
Olive Green
Olive Lake
Permanent Blue
Permanent Yellow
Purple Lake
Sap Green
Scarlet Lake
Sky Blue
Verdigris

DOUBLE, TREBLE, AND QUADRUPLE TUBES ARE ALSO SUPPLIED AT PROPORTIONATE PRICES.

Foundation White, Double 4-inch Tubes, 4d.; ½-lb. Tubes, 8d.; 1-lb. Tubes, 1/4 each.

Cremnitz White, Flake White and Silver White, ½-lb. Tubes, 1/4; 1-lb. Tubes, 2/8 each.

FINELY PREPARED OIL COLOURS,

IN COLLAPSIBLE TUBES (*Continued*).

Two-inch Tubes, 6d. each;

*** "Small Studio" Tubes, 2/- each; "Studio" Tubes, 2/8 each.**

Alizarin Crimson	Chinese Orange	Rembrandt's Madder
Alizarin Green	Chinese Vermilion	Rose Madder (Alizarin)
Alizarin Orange	French Vermilion	Rubens' Madder
Alizarin Scarlet	Geranium Lake	Ruby Madder (Alizarin)
Alizarin Yellow	Green Lake, Light	Scarlet Madder (Alizarin)
Brown Madder	Green Lake, Deep	Sepia
Burnt Lake	Malachite Green, No. 2	Vermilion, Pale
Cerulean Blue	Purple Madder (Alizarin)	Vermilion

Two-inch Tubes, 1/- each;

*** "Small Studio" Tubes, 3/- each; "Studio Tubes," 4/6 each.**

Brilliant Ultramarine	Leitch's Blue	Orange Vermilion
Carmine No. 2	Lemon Yellow, Pale	Oxide of Chromium
Citron Yellow	Lemon Yellow	Oxide of Chromium, Transparent
Cobalt Blue	Madder Lake	Permanent Violet
Cobalt Green	Malachite Green	Primrose Yellow
Cobalt Green, No. 2	Mars Brown	Purple Madder
Cobalt Violet	Mars Orange	Rose Doré
Cyanine Blue	Mars Red	Rose Madder
Emerald Oxide of Chromium	Mars Violet	Rose Madder (pinkshade)
	Mars Yellow	Scarlet Madder
Extract of Vermilion	Mineral Gray	Scarlet Vermilion
French Ultramarine	Mineral Violet	Viridian
Indian Yellow	Mineral Violet No. 2	

Two-inch Tubes, 1/6 each;

*** "Small Studio" Tubes, 3/6 each; "Studio" Tubes, 5/4 each.**

Aureolin	Cadmium Yellow, Deep	Indian Purple
Burnt Carmine	Cadmium Orange	Madder Carmine
Cadmium Lemon	Carmine	Orient Yellow
Cadmium Yell., Ex. Pale	Cobalt Yellow	Violet Carmine
Cadmium Yellow, Pale	Crimson Madder	Yellow Carmine
Cadmium Yellow M'dle	Field's Orange Vermilion	

Two-inch Tubes, 2/- each;

*** "Small Studio" Tubes, 6/- each; "Studio" Tubes, 9/- each.**

Aurora Yellow	Primrose Aureolin	Ultramarine Ash

Two-inch Tubes, 2/6 each.

*** "Small Studio" Tubes, 7/- each; "Studio" Tubes, 10/6 each.**

Extra Madder Carmine	Extra Ultramarine Ash	Extra Purple Madder

Two-inch Tubes, 10/6 each.

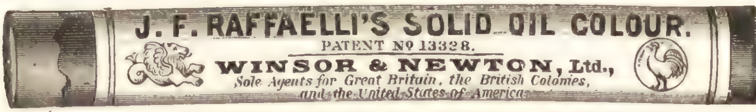
Ultramarine, Genuine, medium strength

Two-inch Tubes, 21/- each.

Ultramarine, Genuine, full strength

* "Small Studio" Tubes contain Four two-inch Tubes. "Studio," Tubes contain Six two-inch Tubes.

"RAFFAËLLI" SOLID OIL COLOURS.



100 TINTS, 6d. EACH.

The names appended to the Tints are merely intended as guides to the general hue of each stick, as the nearest representative among ordinary Oil Colours, and must not be taken as necessarily indicative of the nature of the pigment employed.

NOTE.—The Tints are ranged from dark to light. The first number represents the strongest, and the last the weakest of any given series.

Group 1.—REDS.

1 2 5 6 ...	Rose Madder	24 27	Light Red
7 9	Vermilion	28 29 32... ...	Burnt Sienna
13 16 17... / 19	Bright Flesh Tints	37 ... ... / 38 40 ...	Dark Flesh Tints
20 21 22 23 ...	Indian Red		

Group 2.—YELLOWS.

41 43	Orange	64	Buff Tint
44 46	Deep Cadmium	70 72 74 75 ...	Yellow Ochre
48	Pale Cadmium	77 79	Naples Yellow and Jaune Brilliant
50 53 56... ...	Lemon Cadmium and Lemon Yellow	80 82	Citrine Tints
57	Raw Sienna		

Group 3.—GREENS.

85 86 87 89 91	Viridian	106 108 109 ...	Terre Verte
92 95 96 .	Emerald Green	113 115 ...	Oxide of Chromium
97	Middle Chrome Green	116 117 118 ...	Middle Cinnabar Green
99 102 103 104 105	Various Green and Apple Green Tints	121	Olive Green

Group 4.—BLUES.

124 126 127 128 ...	Prussian and Antwerp Blues	144 147 149 150 ...	Indigo
		151 152 157 ...	Neutral Tints
129 131 134 ...	French Blue and Ultramarine Ash	161	Purple Madder
		164 166 169 ...	Permanent Violet
136 137 139 ...	Cobalt Blue	170	Indian Purple
141	Payne's Gray		

Group 5. BROWNS and WARM MONOCHROME TINTS.

171 172 175 ..	Caledonian Brown	183 187 188 ...	Raw Umber
177 179	Burnt Umber	189	Bitumen
181	Brown Pink		

Group 6.—BLACK, GREYS, and WHITE.

191 194 197 200 ... ... Lamp Black, graduated to White

Boxes containing 20, 30, and 68 Colours, assorted for Landscape or Figure Painting, 13/- to 50/- each.

WINSOR & NEWTON'S

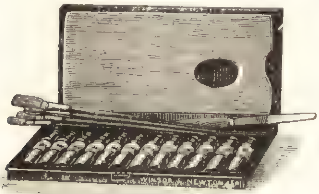
Japanned Tin Boxes,

FITTED WITH

COLOURS AND MATERIALS FOR OIL PAINTING.

Winsor & Newton's Oil Colour Boxes are of the best Material and Workmanship; the range is extensive, and will be found to meet every requirement.

Further improvements have been made in many of the Boxes. In the Tourist's, Compact, Student's, and Companion, the palettes slide into a groove in the body of the box, completely covering the contents and keeping them in their proper positions.



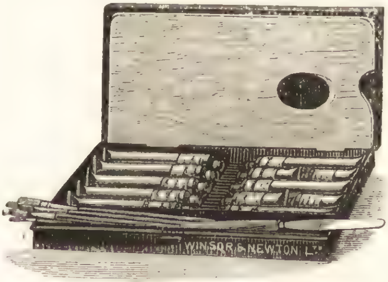
PUPIL'S BOX.

Pupil's Box: Size $7\frac{3}{4}$ in. by $3\frac{3}{4}$ in. 1 in. deep, containing 12 Colours in 2-inch Tubes, 4 Hog-hair Brushes, Mahogany Palette and Palette Knife.

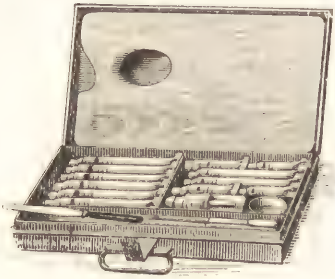
Price, fitted, 6/-; Empty, but with Mahogany Palette, 2/3.

POCKET BOX.

Pocket Box: Size, $9\frac{1}{2}$ in. by $4\frac{3}{4}$ in., 1 in. deep, containing 12 Colours, 6 Hog-hair Brushes, Mahogany Palette and Palette Knife.



Price, fitted, 10/-; Empty, but with Mahogany Palette, 3/6.



TOURIST'S BOX.

TOURIST'S BOX : Size, 9¼ in. by 6, 1¼ inch deep, containing twelve Colours, Brushes, Palette Knife, Oil, Dipper, and Mahogany Palette.

Price, fitted, 12/6 ;

Empty, but with Dipper, Bottle of Oil, and Mahogany Palette, 6/6.

COMPACT BOX.

COMPACT BOX : Size, 10¾ ins. by 7¼, 1⅜ in. deep, containing 18 Colours, Sable and Hog-hair Brushes, Palette Knife, Dipper, Linseed Oil, Turpentine, and Mahogany Palette.

Price, fitted, 18/- ;

Empty, but with Dipper, 5/6.

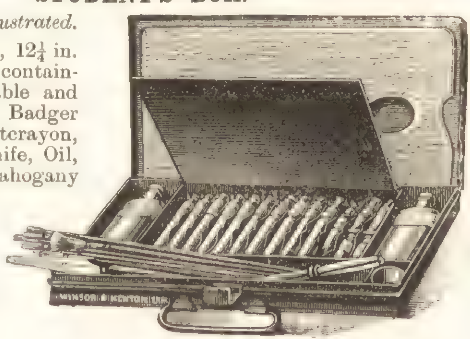
STUDENT'S BOX.

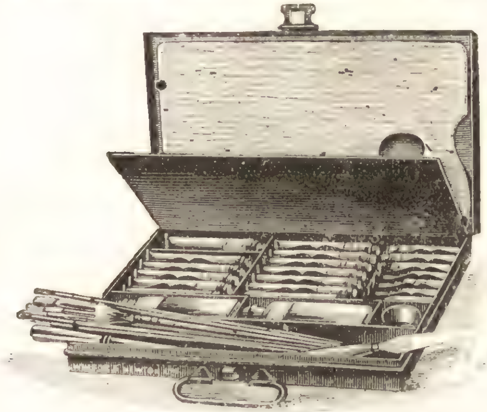
With inside Lid, as Illustrated.

STUDENT'S BOX : Size, 12¼ in. by 6½, 1½ in. deep, containing 15 Colours, Sable and Hog-hair Brushes, Badger Softener, Chalk, Portcrayon, Dipper, Palette Knife, Oil, Turpentine, and Mahogany Palette.

Price, fitted, £1 1s. ;

Empty, but with Dipper, 7/-.





Companion Box.

Companion Box: Size, 13 inches by 9, 1½ inches deep, containing 20 Colours, Sable and Hog-hair Brushes, Badger Softener, Chalk, Portcrayon, Palette Knife, Dipper, Oil, Turpentine, and Mahogany Palette.

Price, fitted, £1 11s. 6d.; Empty, 8/6.

Double Companion Box.

Similar to above, but 2⅛ inches deep, and containing three prepared Millboards, in addition to other fittings.

Price, fitted, £1 17s. 6d.; Empty, 12/-.

Portable Box.

Portable Box: Size, 13¾ inches by 9, 1¾ inches deep, containing 22 Colours, a general selection of Sable and Hog-hair Brushes, Badger Softener, Chalk, Portcrayon, Oil, Turpentine, Palette Knife, Capped Dipper, and Mahogany Palette.

Price, fitted, £2 2s.; Empty, 12/-.

Double Portable Box.

Similar to above, but 2½ inches deep, and containing three prepared Millboards, in addition to other fittings.

Price, fitted, £2 12s. 6d.; Empty, 16/-.

Academy and Studio Boxes.

Fitted in the most complete manner.

3 Guineas to 24 Guineas.

Polished Oak or Walnut Oil Colour Sketching Boxes.

BEST MAKE.

These Boxes are lined with Tin, and contain two Tin Oil Bottles, Double Dipper, Palette, and Two Wood Panels.

Nos.	Size.			s.	d.	Nos.	Size.			s.	d.
*1	9¼ inches by	6¼	each	13	6	4	13 inches by	10¼	each	21	0
*2	10¼ ,,	6¾	,,	15	0	5	15 ,,	11¼	,,	24	0
3	11 ,,	8½	,,	16	6	6	17 ,,	13¼	,,	27	0

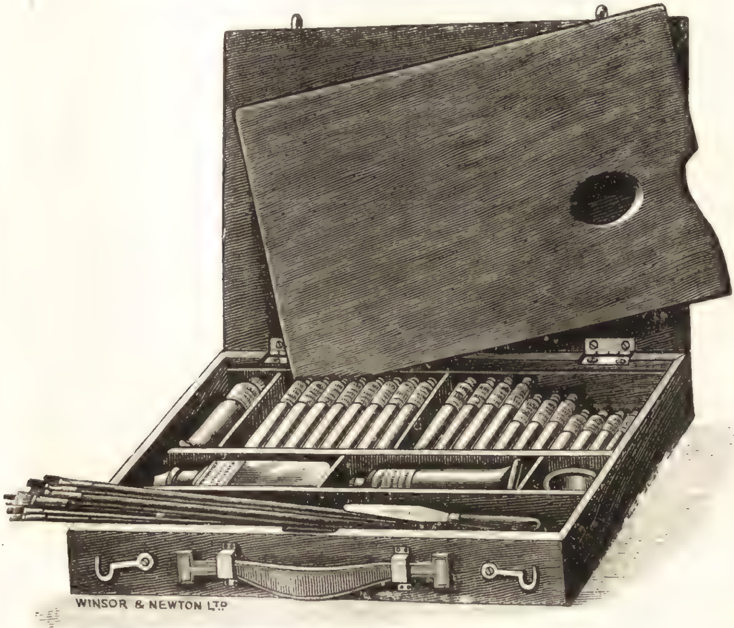
*—Nos. 1 and 2 are Thumb-hole Boxes.

The above Boxes, containing in addition 10 to 26 Colours, Brushes, Oil, Turpentine, Palette Knife, &c., as illustrated.

Nos.		£	s.	d.	Nos.		£	s.	d.
1	each	0	18	6	4	each	1	15	0
2	,,	1	1	0	5	,,	2	5	0
3	,,	1	4	0	6	,,	2	14	0

THE "LANDSCAPE" WALNUT WOOD BOX,

FOR OIL COLOUR PAINTING.



SIZE, 13 INCHES BY 9; 2 INCHES DEEP.

A Convenient and Inexpensive Oil Colour Box for Out-door Work.

The Fitted Box illustrated above contains 20 COLOURS IN TUBES, LINSEED OIL, TURPENTINE, IMPROVED DIPPER, SABLE and HOG HAIR BRUSHES, PALETTE KNIFE, and a WALNUT PALETTE.

PRICE ONE GUINEA.

THE BOX WITH WALNUT PALETTE ONLY, **8/6.**

Varnishes and Oils.

	Small Glass Bottles. each.		Glass Bottles Round or Flat.* each.		¼ Pint Stone or Tin, or 6 oz. Glass Bottles. each.		½ Pints in Stone, Tin, or Glass Bottles. each.		Pints in Stone. Tin, or Glass, Bottles. each.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Picture Mastic Varnish for Varnishing	0	9	1	6	3	0	5	6	10	0
Mastic Varnish for Megilp	1	0	2	0	3	9	7	0	13	6
Amber Varnish	0	9	1	6	3	0	5	6	10	0
Amber Varnish, Light ...	1	0	2	0	3	9	7	0	13	6
Oil of Spike Lavender ...	0	9	1	6	3	0	5	6	10	0
Picture Copal Varnish ...	0	6	1	0	1	9	3	0	6	0
Oil Copal Varnish... ...	0	6	1	0	1	9	3	0	6	0
White Spirit Varnish ...	0	6	1	0	1	9	3	0	6	0
Brown Spirit Varnish ...	0	6	1	0	1	9	3	0	6	0
White Lac Varnish ...	0	6	1	0	1	9	3	0	6	0
COPAL OIL MEDIUM...	0	6	1	0	1	9	3	0	6	0
Oil Vehicles (see page 27)	0	6	1	0	1	9	3	0	6	0
Crystal or Map Varnish ...	0	5	0	9	1	3	2	3	4	6
Japan Gold Size	0	4	0	8	1	0	2	0	3	9
Fat Oil	0	5	0	9	1	3	2	3	4	6
Walnut Oil (Nut Oil) ...	0	3	0	6	1	0	1	6	3	0
Poppy Oil	0	3	0	6	1	0	1	6	3	0
Manganesed Poppy Oil ...	0	3	0	6	1	0	1	6	3	0
Pale Drying Oil	0	3	0	6	0	10	1	3	2	3
Strong Drying Oil... ...	0	3	0	6	0	10	1	3	2	3
Purified Linseed Oil ...	0	3	0	6	0	9	1	2	2	0
Manganesed Linseed Oil...	0	3	0	6	0	9	1	2	2	0
Spirits of Turpentine	0	3	0	5	0	6	0	11	1	6

*—The Flat Bottles fit the majority of the Japanned Tin Oil Colour Boxes.

MEDIUMS FOR OIL PAINTING.

	Per Bottle. s.	d.
Amber Medium, for oil painting on glass	1	6
Adolfi Medium, for painting on silk or satin	1	0
Liquid Size, for preparing terra-cotta plaques for painting, &c. ...	0	6
Siccatif Courtray	0	9
Siccatif de Harlem (Duroziez's)	1	3
,, ,, ,, large size	2	6
Soehnée Varnish, No 3	1	0
,, ,, large size...	2	0

WINSOR & NEWTON'S
OIL VEHICLES.

MESSRS. WINSOR & NEWTON'S newly introduced "Oil Vehicles" are intended mainly to save the time of the Painter. There is no secret about their composition, nor is the principle of their construction a new one, practised as it was centuries ago in the sunny clime of Italy. The difficulties, however, of carrying out the Italian process, on a commercial scale, in the latitude of England, have hitherto prevented Artists' Colourmen from attempting the manufacture.

Briefly, the Vehicles are made as follows:—The Oil (Linseed, Poppy, or Walnut, as the case may be) is first purified by a prolonged exposure to moisture and sunlight until (without the use of chemicals) it becomes free from mucilage, almost destitute of colour, and of crystal transparency. In this condition, the oil is separated from water and impurities, and allowed to thicken gradually by free exposure to air. When it is of the consistency of honey, the process is stopped, and the product, now much too viscous to paint with comfortably, is dissolved in Oil of Spike, Turpentine, or Petroleum, until its degree of fluidity is about the same as that of the original oil before treatment. In this condition it is used for painting.

The drying of the oil, which usually takes place on the picture itself, about the same as that of the original oil before treatment. In this is thus in a great measure accomplished before the artist begins to paint, and the progress of his work is correspondingly accelerated. As the Oil Vehicles dry in a natural manner without the use of dryers and contain no resinous substances, they may be employed with absolute confidence as to their future behaviour. The artist, too, with these vehicles, knows exactly what he is using; and this, nowadays, when secret nostra are resolutely boycotted by the better class of painters, is a great point in their favour.

The Series consists of Six Vehicles as follows:—

"OIL VEHICLE	No. 1"	is prepared	from	Linseed Oil	and	Oil of Spike
,,	,,	No. 1A	,,	,,	,,		Turpentine
,,	,,	No. 1B	,,	,,	,,		Petroleum
"OIL VEHICLE	No. 2"	is prepared	from	Poppy Oil	and	Oil of Spike
,,	,,	No. 2A	,,	,,	,,		Turpentine
,,	,,	No. 2B	,,	,,	,,		Petroleum

Vehicles made from Walnut Oil are made only for Special Orders.

N.B.—The Vehicle prepared with Oil of Spike evaporates more slowly than the others, and will probably be found, for general purposes, the most convenient. That prepared with petroleum evaporates the most rapidly, the Turpentine preparation occupying an intermediate position.

PRICES.

		s.	d.			s.	d.
Small Bottles ...	each	0	6	¼-Pint Bottles or Tins,	each	1	9
Round or Flat Bottles	,,	1	0	½-Pint ,, ,,	,,	3	0
6-oz. Glass Bottles ...	,,	1	9	Pint ,, ,,	,,	6	0

Brushes for Painting in Water Colours.

BRUSHES IN QUILLS.

	Colour of Silk Tie	Brown Sable Hair. each. s. d.	Red Sable Hair. each. s. d.	Best Siberian Hair. per doz. s. d.	Best Camel Hair. per doz. s. d.
Crow...	*Blue*	0 5	0 3	1 6	0 6
Duck	*Magenta*	0 9	0 6	2 3	0 9
Small Goose ...	*Green*	1 2	0 10	3 0	--
Goose	*Pink*	1 6	1 0	3 9	1 6
Extra Goose ...	*Amber*	2 0	1 3	4 6	--
IN LONG QUILLS				each.	each.
Extra Small Swan...	*Blue*	4 0	2 8	1 0	0 8
Small Swan ...	*Magenta*	6 0	3 6	1 3	1 0
Middle Swan ...	*Green*	9 0	4 6	1 9	1 4
Large Swan ...	*Pink*	12 0	6 0	2 6	1 8

SABLE BRUSHES IN ALBATA FERRULES.

	Brown Sable Hair. each. s. d.	Red Sable Hair. each. s. d.
Nos. 0 & 1 Flat or Round	1 0	0 8
,, 2 ,, ...	1 4	0 10
,, 3 ,, ...	1 8	1 0
,, 4 ,, ...	2 0	1 3
,, 5 ,, ...	2 6	1 6
,, 6 ,, ...	3 0	2 0
,, 7 ,, ...	4 0	2 3

EXTRA LARGE SERIES.	Brown Flat. s. d.	Brown Round. s. d.	Red Flat. s. d.	Red Round. s. d.
No. 1 Flat or Round ... ... each	5 9	6 9	3 3	3 9
,, 2 ,, ... ,,	8 6	9 9	5 3	5 9
,, 3 ,, ... ,,	11 0	12 9	7 0	7 6
,, 4 ,, ... ,,	13 6	16 0	9 0	10 6
,, 5 ,, ... ,,	17 6	18 0	11 6	13 6
,, 6 ,, ... ,,	20 0	21 0	14 0	16 0

Brushes for Painting in Water Colours.

BRUSHES IN NICKEL FERRULES.

	Brown Sable Hair	Red Sable Hair	Brown Fitch Hair	Best Siberian Hair
	s. d.	*s. d.*	*s. d.*	*s. d.*
Nos. 0 & 1 Flat or Round...each	0 10	0 5	0 4	0 3
,, 2 ,, ,,	1 0	0 6	0 4	0 4
,, 3 ,, ,,	1 2	0 7	0 4	0 4
,, 4 ,, ,,	1 4	0 8	0 5	0 5
,, 5 ,, ,,	1 8	0 10	0 5	0 5
,, 6 ,, ,,	2 0	1 0	0 5	0 6
,, 7 Flat ... ... ,,	2 3	1 4	0 6	0 8
,, 8 ,, ... ,,	—	1 8	0 7	0 10
,, 9 ,, ... ,,	—	2 0	0 9	1 0
,, 7 Round ... ... ,,	3 0	1 8	0 6	0 8
,, 8 ,, ... ,,	—	2 0	0 7	0 10
,, 9 ,, ... ,,	—	2 8	0 9	1 0

BEST CAMEL HAIR BRUSHES IN TIN FERRULES.

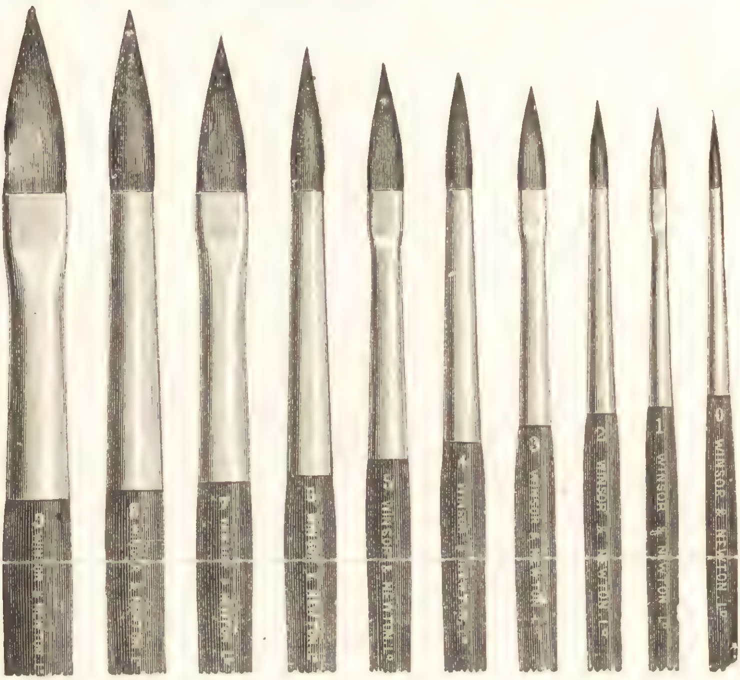
	per doz.
	s. d.
No. 1 Flat or Round	1 2
,, 2 ,, ...	1 3
,, 3 ,, ...	1 4
,, 4 ,, ...	1 6
,, 5 ,, ...	1 9
,, 6 ,, ...	2 0
,, 7 ,, ...	2 6
,, 8 ,, ...	3 0
,, 9 ,, ...	3 9
,, 10 ,, ...	4 9
,, 11 ,, ...	5 6
,, 12 ,, ...	6 0

WASH OR SKY BRUSHES IN NICKEL FERRULES.

	Flat.	Round.
	s. d.	*s. d.*
Dyed Sable Hair, large size ... ... each	3 6	4 0
Ditto small size ... ... ,,	3 0	3 6
Best Siberian Hair, large size ... ... ,,	1 3	1 3
Ditto small size ... ... ,,	0 9	0 9

Brushes for Painting in Oil Colours.

Finest Red Sable Hair in Nickel Ferrules.



FLAT OR ROUND.				FLAT.				ROUND.			
Nos.		*s.*	*d.*	Nos.		*s.*	*d.*	Nos.		*s.*	*d.*
0 and 1	... each	0	5	7	... each	1	4	7	... each	1	8
2	... ... ,,	0	6	8	... ,,	1	8	8	.. ,,	2	0
3	... ... ,,	0	7	9	... ,,	2	0	9	... ,,	2	8
4	... ... ,,	0	8	10	... ,,	2	8	10	... ,,	3	3
5	... ... ,,	0	10	11	... ,,	3	3	11	... ,,	4	0
6	... ... ,,	1	0	12	... ,,	4	0	12	... ,,	4	9

"NEWLYN" BRUSHES, made short and thin in the Hair, and square at the corners, are supplied flat only at the same prices as above.

Extra Fine Hog Hair Brushes, A Series.

Nickel Ferrules, 12-inch Yellow Polished Handles.

MADE OF THE SOFTEST LYONS HAIR.

Nos.	Each. s.	d.	Nos.	Each. s.	d.
1 to 6, Flat or Round, all sizes ...	0	8	9, Flat or Round	1	1
7 ,, ,, ...	0	9	10 ,, ,, ...	1	3
8 ,, ,, ...	1	0	11 ,, ,, ...	1	6
			12 ,, ,, ...	1	9

Herkomer Brushes.

Extra Fine Hog Hair in Nickel Ferrules.

Short and thin in hair. Quality and Prices as **A** Series above.

Hog Hair Brushes, B Series.

Nickel Ferrules, 12-inch Red Polished Cedar Handles.

Nos.	Each. s.	d.	Nos.	Each. s.	d.
1 to 6, Flat or Round, all sizes ...	0	4	12, Flat or Round	0	10
7 Flat or Round ...	0	5	13 ,, ,, ...	1	3
8 ,, ,, ...	0	6	14 ,, ,, ...	1	6
9 ,, ,, ...	0	7	15 ,, ,, ...	1	9
10 ,, ,, ...	0	8	16 ,, ,, ...	2	0
11 ,, ,, ...	0	9	17 ,, ,, ...	2	3
			18 ,, ,, ...	2	8

"New Bright's" Hog Hair Brushes.

An improved form of the "Bright's" Brush, being a trifle shorter and thinner in the hair, and made with a squarer top. Quality and Prices as **B** Series above.

Hog Hair Brushes, C Series.

Tin Ferrules, 12-inch Natural Polished Cedar Handles.

Nos.	Each. s.	d.	Nos.	Each. s.	d.
1 to 6, Flat or Round, all sizes ...	0	3	9, Flat or Round	0	6
7 Flat or Round ...	0	4	10 ,, ,, ...	0	7
8 ,, ,, ...	0	5	11 ,, ,, ...	0	8
			12 ,, ,, ...	0	9

HOG HAIR BRUSHES, G Series.

Tin Ferrules, 12-inch White Wood Handles.

Short and very thin in Hair.

Nos.	Each. s. d.	Nos.	Each. s. d.
1 to 6, Flat only, all sizes	0 3	13, Flat only	0 9
7 ,, ,,	0 4	14 ,, ,, ...	1 0
8 ,, ,,	0 5	15 ,, ,, ...	1 2
9 ,, ,,	0 6	16 ,, ,, ...	1 4
10 ,, ,,	0 6	17 ,, ,, ...	1 6
11 ,, ,,	0 7	18 ,, ,, ...	1 9
12 ,, ,,	0 8		

STUDENTS' HOG HAIR BRUSHES.

Nickelled Tin Ferrules, Black Polished Handles.

Sound, reliable Brushes of the approved shape, short and thin in hair, with a square top.

Nos.	Each. s. d.	Nos.	Each. s. d.
1 to 6, Flat only, all sizes	0 2	9 & 10, Flat only... ...	0 5
7 & 8 ,, ,,	0 4	11 & 12 ,, ,, ...	0 7

BROWN FITCH HAIR BRUSHES.

Nickel Ferrules, 12-inch Natural Polished Cedar Handles.

Improved shape, SHORT AND THIN IN THE HAIR, and with square points.

Nos.	Each. s. d.	Nos.	Each. s. d.
1, 2, and 3, Flat only ...	0 3	9, Flat only	0 7
4, 5, and 6 ,, ...	0 4	10 ,, ...	0 8
7 ,, ...	0 5	11 ,, ...	0 9
8 ,, ...	0 6	12 ,, ...	0 10

FINEST ROUND BADGER HAIR SOFTENERS.

With Red Polished Cedar Handles.

Nos.	Each. s. d.	Nos.	Each. s. d.	Nos.	Each. s. d.
1	0 9	4	1 6	7	3 0
2	0 11	5	2 0	8	4 0
3	1 1	6	2 3	9	4 6

FLAT HOG HAIR VARNISHING BRUSHES.

Nickel Ferrules, Natural Polished Cedar Handles.

Made of the softest Hog Hair.

	Each. s. d.		Each. s. d.		Each. s. d.
1 inch wide ...	1 2	2½ inches wide	2 9	3½ inches wide	4 0
1½ ,, ...	1 9	3 ,,	3 6	4 ,,	4 6
2 ,, ...	2 3				

WINSOR & NEWTON'S

ARTISTS' PREPARED CANVAS.

For Painting in Oil Colours.

	BEST QUALITY Single primed, Full primed & Roman Canvas.	BEST QUALITY Ticken Canvas.	SECOND QUALITY Single Primed & Full primed.	THIRD QUALITY.
	s. d.	*s. d.*	*s. d.*	*s. d.*
27 inches wide per yard.	3 0	3 8	2 3	1 8
30 ,, ,, ... ,,	3 3	4 0	2 6	—
36 ,, ,, ... ,,	3 9	4 9	3 0	2 3
38 ,, ,, ... ,,	4 0	5 3	3 2	—
42 ,, ,, ... ,,	4 6	5 9	3 6	—
45 ,, ,, ... ,,	5 3	6 6	3 9	—
54 ,, ,, ... ,,	7 0	8 0	4 6	3 6
62 ,, ,, ... ,,	8 6	10 0	5 0	4 0
74 ,, ,, ... ,,	10 6	12 0	6 0	5 0
86 ,, ,, ... ,,	12 6	15 0	7 0	—

"WINTON" ARTISTS' PREPARED CANVAS.

A new variety introduced to meet the requirements of those numerous Artists who prefer a more pronounced grain in their Canvas than is afforded by the ordinary Single-primed. The "Winton" Canvas is firm in substance, of even texture, and has a grain about midway between the Single-primed and Roman varieties. It is a specially woven fabric, prepared by Winsor & Newton, Limited, and will be found superior to the foreign productions which have been offered of late at higher prices.

	s. d.		*s. d.*
27 inches wide per yard	2 6	45 inches wide per yard	4 4
30 ,, ,, ,,	2 9	54 ,, ,, ,,	5 0
36 ,, ,, ,,	3 6	74 ,, ,, ,,	7 0
42 ,, ,, ,,	4 0		

A Sample will be sent post free on application.

Winton Canvas on Stretchers is supplied in all the regular sizes at proportionate prices.

C

WINSOR & NEWTON'S ARTISTS' CANVAS.

Strained on Wedged Stretchers, with Bevelled Inside Edges.

Size in Inches.	Best quality each. s.	d.	2nd quality each. s.	d.	3rd quality each. s.	d.
7 by 5	0	8	0	6	0	4
8 ,, 6	0	8	0	6	0	5
9 ,, 6	0	9	0	6	0	5
9 ,, 7	0	11	0	7	0	6
10 ,, 6	0	11	0	8	0	6
10 ,, 7	0	11	0	8	0	6
10 ,, 8	1	0	0	9	0	6
11 ,, 9	1	2	0	10	0	7
12 ,, 6	0	11	0	9	0	6
12 ,, 8	1	1	0	9	0	7
12 ,, 9	1	2	0	10	0	7
12 ,, 10	1	2	0	10	0	7
13 ,, 8	1	2	0	11	0	8
13 ,, 9	1	2	0	11	0	8
13 ,, 10	1	3	0	11	0	8
13 ,, 11	1	4	0	11	0	8
14 ,, 6	1	2	0	9	0	7
14 ,, 7	1	2	0	9	0	7
14 ,, 8	1	2	0	10	0	8
14 ,, 9	1	4	0	11	0	8
14 ,, 10	1	4	0	11	0	8
14 ,, 12	1	5	1	0	0	9
15 ,, 11	1	6	1	1	0	10
15 ,, 12	1	6	1	1	0	10
16 ,, 8	1	4	1	0	0	9
16 ,, 10	1	5	1	1	0	10
16 ,, 11	1	6	1	1	0	10
16 ,, 12	1	7	1	2	0	10
16 ,, 14	1	9	1	3	0	11
17 ,, 13	1	9	1	4	1	0
17 ,, 14	1	10	1	4	1	0
18½ ,, 8½	1	6	1	1	0	11
18 ,, 10	1	7	1	1	0	11
18 ,, 12	1	9	1	2	1	0
18 ,, 14	2	0	1	4	1	1
18 ,, 15	2	0	1	6	1	2
18 ,, 16	2	0	1	6	1	2
19 ,, 9	1	8	1	1	0	11
19 ,, 13	1	11	1	4	1	1
19 ,, 15	2	1	1	6	1	3
20 ,, 10	1	10	1	4	1	1
20 ,, 12	1	11	1	4	1	2
20 ,, 14	2	1	1	6	1	2
20 ,, 15	2	2	1	7	1	3
20 ,, 16	2	2	1	7	1	3
21 ,, 14	2	2	1	6	1	3
21 ,, 17	2	4	1	9	1	4

Size in Inches.	Best quality each. s.	d.	2nd quality each. s.	d.	3rd quality each. s.	d.
22 by 10	2	1	1	6	1	2
22 ,, 14	2	4	1	7	1	4
22 ,, 15	2	4	1	8	1	3
22 ,, 16	2	4	1	9	1	4
22 ,, 17	2	6	1	10	1	4
22 ,, 18	2	8	1	10	1	4
24 ,, 10	2	1	1	7	1	3
24 ,, 12	2	2	1	7	1	3
24 ,, 14	2	4	1	9	1	4
24 ,, 16	2	8	2	0	1	5
24 ,, 18	2	10	2	0	1	6
24 ,, 20	3	2	2	2	1	7
26 ,, 16	3	0	2	2	1	7
26 ,, 18	3	2	2	2	1	9
26 ,, 20	3	6	2	4	1	10
26 ,, 22	3	8	2	6	2	0
27 ,, 20	3	6	2	9	1	10
27 ,, 22	3	8	2	9	2	0
30 ,, 13	3	2	2	2	1	7
30 ,, 18	3	8	2	8	1	10
30 ,, 20	3	10	2	11	2	0
30 ,, 22	4	3	3	0	2	3
30 ,, 24	4	4	3	1	2	6
30 ,, 25	4	6	3	2	2	6
32 ,, 18	4	0	2	11	2	3
36 ,, 20	4	6	3	6	2	6
36 ,, 24	5	3	3	8	2	8
36 ,, 28	5	9	4	0	3	0
37 ,, 13	4	3	3	2	2	4
38 ,, 14	4	9	3	4	2	6
40 ,, 24	6	4	5	3	—	
40 ,, 28	7	4	5	9	—	
40 ,, 30	8	4	6	3	—	
42 ,, 24	6	9	5	6	—	
42 ,, 28	7	10	6	3	—	
44 ,, 34	10	0	8	0	—	
48 ,, 36	11	6	9	6	—	
50 ,, 30	11	0	8	8	—	
50 ,, 40	13	0	10	6	—	
54 ,, 36	13	0	10	6	—	
56 ,, 44	17	6	13	4	—	
60 ,, 40	16	6	13	3	—	
72 ,, 54	33	0	25	0	—	
88 ,, 52	38	0	28	6	—	
94 ,, 58	44	0	35	0	—	
106 ,, 70	56	0	47	0	—	

Academy Boards.

BEST QUALITY	Inches.	Thin. Each. s. d.	Thick. Each. s. d.
Academy Boards	24½ by 18½	1 0	1 3
Half ,,	18½ ,, 12½	0 6	0 8
Quarto ,,	12¼ ,, 9¼	0 3	0 4
Octavo ,,	9¼ ,, 6	0 1½	0 2

"Rough Surfaced" Academy Boards.

These Boards are carefully abraded by hand, and offer an agreeable contrast to the smooth surface of the older kind.

ORDINARY SIZES. Inches.	Each. s. d.	PANEL SIZES.* Inches.	Each. s. d.	Inches.	Each. s. d.
Whole Size, 24½ by 18½	1 0	15 by 8	0 4	26 by 10	0 9
Half ,, 18½ ,, 12¼	0 6	18 ,, 8	0 6	30 ,, 13	1 0
Quarto ,, 12¼ ,, 9¼	0 3	18½ ,, 13	0 8	37 ,, 13	1 6
Octavo ,, 9¼ ,, 6	0 1½	24 ,, 12	0 9		

Students' Academy Boards.

ORDINARY SIZES. Inches.	Each. s. d.	PANEL SIZES.* Inches.	Each. s. d.	Inches.	Each. s. d.
Whole Size, 24½ by 18½	0 8	15 by 8	0 3	26 by 10	0 8
Half ,, 18½ ,, 12¼	0 4	18 ,, 8	0 4	30 ,, 13	0 10
Quarto ,, 12¼ ,, 9¼	0 2	18½ ,, 13	0 6	37 ,, 13	1 3
Octavo ,, 9¼ ,, 6	0 1	24 ,, 12	0 8		

* These sizes correspond with those of Madame Vouga's and other panel studies.

Millboards and Mahogany Panels.

Prepared for Painting in Oil Colours.

Millboards, 44 sizes, 6 ins. by 5 ins. 6d., to 30 ins. by 25 ins. 9/-.

Mahogany Panels, 42 sizes, 8 ins. by 6 ins. 1/3, to 36 ins. by 28 ins. 37/-.

White Wood Panels.

Unprepared.

Eighteen sizes, 8 ins. by 6 ins. 3d., to 20 ins. by 12 ins. 1/-.

Oil Sketching Paper.

In four different surfaces, prepared to imitate the textures of Plain, Single Primed, Roman, and Ticken Canvases.

	s.	d.
Prepared on Imperial Paper, 30 inches by 22 inches ... per sheet	0	9
Ditto, ditto, Extra Thick 30 ,, by 22 ,, ... ,,	1	0

Oil Sketching Tablets.

(Millboards covered with Prepared Oil Sketching Paper.)

Size in inches.	Each. s.	d.	Size in inches.	Each. s.	d.	Size in inches.	Each. s.	d.
$5\frac{1}{2}$ by $4\frac{1}{2}$	0	2	$11\frac{1}{2}$ by 9	0	5	18 by $11\frac{1}{2}$	0	8
7 ,, 5	0	2	12 ,, 8	0	5	20 ,, 14	0	9
8 ,, 6	0	3	12 ,, 9	0	5	24 ,, 12	1	0
9 ,, $5\frac{1}{2}$	0	3	14 ,, $6\frac{3}{4}$	0	5	28 ,, 12	1	0
10 ,, 7	0	3	14 ,, 10	0	6	30 ,, 13	1	6
10 ,, 8	0	4	16 ,, 12	0	8	37 ,, 13	2	0
						42 ,, $13\frac{1}{2}$	2	3

Made in three surfaces—Plain, Single-primed, and Roman. Single-primed surface is sent unless otherwise ordered.

The Winton Shaded Art Panels.

FOR PAINTING IN OIL COLOURS.

Prepared in Six Tints, viz.:—GREEN, ROSE, AZURE, OWN, GREY, and OLIVE.

Size in inches.	Each. s.	d.	Size in inches.	Each. s.	d.
9 by $5\frac{1}{2}$	0	6	18 by 10	1	6
10 ,, 7	0	8	20 ,, 10	1	6
12 ,, 8	1	0	20 ,, 12	1	9
14 ,, $6\frac{3}{4}$	1	0	20 ,, 14	1	9
14 ,, 10	1	3	24 ,, 12	2	0
16 ,, 8	1	3	28 ,, 12	2	6

	s.	d.
30 by 13 inches, green, brown, grey, and olive only	3	6
37 ,, 13 ,, ,, ,, ,, ,, ...	4	0
42 ,, $13\frac{1}{2}$,, ,, ,, ,, ,, ...	5	0

Other sizes, up to 20 in. wide, are made to order at proportionate prices.

The "Winton" Art Panels are manufactured and prepared solely by Winsor and Newton, Ltd. The surface is carefully shaded by hand and affords an especially suitable ground for painting Flowers, Fruit, &c., or copying Madame Vouga's Studies.

Canvas Boards.

Millboards covered with Artists' Prepared Canvas.

Best Quality, 20 sizes, 7 in. by 5 in., 7d., to 20 in. by 14 in., 3/- each
21 by $10\frac{1}{2}$ in., 3/2; 42 by $10\frac{1}{2}$ in., 6/6 each.

Second Quality, 20 sizes, 7 in. by 5 in., 6d., to 20 in. by 14 in., 2/- each.

Japanned Tin Plaques (Circular).

With Rings at back.

Prepared for Painting in Oil Colours.

PLAIN.—Six Tints: Cream, Terra Cotta, Pale Blue, Pale Pink, Pale Green, and Black.

SHADED.—Three Tints; Brown, Green, and Grey.

Diameter.	Plain. Each. s. d.	Shaded. Each. s. d.
6 inches	0 8	—
7 ,,	0 10	—
8 ,,	1 0	1 2
9 ,,	1 2	1 4
10 ,,	1 3	1 6
11 ,,	1 5	1 9
12 ,,	1 6	2 0
13 ,,	2 0	2 6
14 ,,	2 6	2 9
16 ,,	3 6	4 0

Solid Blocks for Painting in Oil Colours.

Made of Thick Paper, 24 Surfaces.

	Inches.		Blocks only. s. d.	Half Bound and with Protective Frames. s. d.
16mo Imperial	7 by 5	each	1 9	3 9
8vo ,,	10 ,, 7	,,	3 0	6 3
4to Royal	$11\frac{1}{2}$,, 9	,,	5 0	9 0
6mo Imperial	14 ,, $6\frac{3}{4}$	,,	4 6	8 6
4to ,,	14 ,, 10	,,	6 0	10 6

Made of Extra Thick Paper, 18 Surfaces.

	Inches.		Blocks only. s. d.	Half Bound and with Protective Frames. s. d.
16mo Imperial	7 by 5	each	1 9	3 9
8vo ,,	10 ,, 7	,,	3 0	6 3
4to Royal	$11\frac{1}{2}$,, 9	,,	5 0	9 0
6mo Imperial	14 ,, $6\frac{3}{4}$	,,	4 6	8 6
4to ,,	14 ,, 10	,,	6 0	10 6
3mo ,,	18 ,, 10	,,	8 6	16 0
Half ,,	20 ,, 14	,,	12 0	21 0

These Blocks are made with Oil Sketching Paper of the four different surfaces described on Page 36. Single Primed Surface Blocks are sent unless otherwise ordered.

DRAWING PAPERS.

Messrs. Winsor & Newton, Limited, pay particular attention to this department, and keep constantly on hand a very large and varied Stock of Seasoned First-class Drawing Papers, comprising all kinds required, including the "O.W." Hand-made Drawing Paper recently introduced and stamped "Guaranteed Pure Paper R.W.S."

WHATMAN'S DRAWING PAPER.

	Weight to Ream.		Inches.	Per Sheet. s.	d.
Demy	25 lbs. ...	Hotpressed and Not ...	20 by $15\frac{1}{4}$	0	$1\frac{1}{2}$
Medium ...	34 ,, ...	,, ,, ...	22 ,, $17\frac{1}{2}$	0	$2\frac{1}{2}$
Royal	44 ,, ...	Hotpressed, Not, and Rough	24 ,, $19\frac{1}{2}$	0	3
Imperial ...	72 ,, ...	,, ,, ...	$30\frac{1}{2}$,, 22	0	5
Dble. Elephant	133 ,, ...	,, ,, ...	40 ,, $26\frac{3}{4}$	0	10
Antiquarian	240 ,, ...	,, ,, ...	$52\frac{1}{2}$,, $30\frac{1}{2}$	4	0

WHATMAN'S "THICK" AND "EXTRA THICK" DRAWING PAPER.

	Weight to Ream.		Per Sheet. s.	d.	*Artists Per Sheet. s.	d.
Royal	60 lbs. ...	Hotpressed, Not, and Rough	0	5	—	
Imperial ...	90 ,, ...	,, ,,	0	8	0	9
,, ...	140 ,, ...	,, ,,	1	0	1	2
,, ...	300 ,, ...	,, ,,	—		2	6
Dble. Elephant	235 ,, ...	,, ,,	1	8	2	0

**Artists' Drawing Paper consists of Sheets carefully selected at the Mill.*

"O.W." DRAWING PAPER.

A Hand-made Paper, manufactured under the direction of the Royal Society of Painters in Water Colours.

	Weight to Ream.		Per Sheet. s.	d.
Imperial ...	72 lbs	Nos. 1 and 4 Surfaces	0	5
,, ...	90 ,,	,, 4 Surface	0	8
,, ...	140 ,,	,, 4 ,, ...	1	0
Dble. Elephant	140 ,,	,, 4 ,, ...	1	0
,, ,, ...	325 ,,	,, 40 ,, ...	2	3
Antiquarian ...	240 ,,	,, 4 ,, ...	9	0

WINSOR & NEWTON'S

"IMITATION STEINBACH" DRAWING PAPER.

Suitable for Drawing in Water Colours, Pastel Crayons, Pencil and Charcoal, and for general Black and White Work.

Imperial, 30 by 22½ in., 65 lbs. to ream... ... ... 3/9 per quire.
Continuous, 54 inches wide ... ... 6d. per yard.

(Reduced prices for original rolls of 25, 50, and 100 yards.)

HOLLINGWORTH'S

"IMPROVED" DRAWING PAPER.

	Weight to Ream.		Inches.	Sheet. s.	d.
Demy	24 lbs.,	Hotpressed and Not,	20 by 15½ ...	0	1
Medium	32 ,,	,, ,,	22 ,, 17¾ ...	0	1½
Royal	42 ,,	,, ,,	24 ,, 19 ...	0	2
Imperial	72 ,,	,, ,,	30¼ ,, 22¼ ...	0	3
,, ...	90 ,,	,, ,,	30¼ ,, 22¼ ...	0	4
Dble. Elephant ...	130 ,,	,, ,,	40 ,, 26¾ ...	0	6

BEST MACHINE-MADE TINTED CRAYON PAPERS.

	Weight to Ream.		Inches.	Per Sheet. s.	d.
Imperial	90 lbs. ...	33 Tints ...	30 by 21½ ...	0	4
Dble. Elephant ...	144 ,, ...	6 ,, ...	40 ,, 27 ...	0	6

MICHALLET FRENCH HAND-MADE CRAYON PAPER.

		Inches.	Per Quire. s.	d.
Royal ...	No. 1, White; Nos. 2 to 12, various Tints ...	24 by 19 ...	2	6

Pattern Books of Tinted Crayon and other Drawing Papers may be had on application.

CARTRIDGE DRAWING PAPER.

	Weight to Ream.	Inches.	Per Sheet. s. d.	Per Quire. s. d.
SUPERFINE:				
Students'	60 lbs.	30 by 22	0 2	3 0
Imperial (Hotpressed and Not)	·78 ,,	30 ,, 22	0 3	5 3
FINE:				
Medium	30 lbs.	22 by 17	0 1	1 3
Royal	48 ,,	24 ,, 19	0 1½	2 3
Thin Log	38 ,,	26 ,, 21	0 1	2 0
Thick Log	48 ,,	26 ,, 21	0 1½	2 3
Thin Engineers	70 ,,	30 ,, 22	0 2	3 6
Thick Engineers	90 ,,	30 ,, 22	0 2½	4 6
Double Elephant	120 ,,	40 ,, 27	0 3½	5 6
GOOD:				
Royal School of Art	40 lbs.	24 by 19	0 1	1 3
Imperial School of Art	60 ,,	30 ,, 22	0 1	2 0
Imperial White	70 ,,	30 ,, 22	0 1½	2 3

CONTINUOUS CARTOON CARTRIDGE PAPER.

		Per Yard. s. d.
White Cartoon Paper, Thin	36 inches wide	0 4
,, ,, ,, Medium	45 ,,	0 6
,, ,, ,, Thin	54 ,,	0 7
,, ,, ,, Thick	30 ,,	0 7
,, ,, ,, ,,	54 ,,	1 2
,, ,, ,, ,,	60 ,,	1 2
Tinted Cartoon Paper	54 ,,	0 10

(Three Tints—Buff, Stone, and French Grey.)

Transfer Papers.

IN SHEETS 22½ by 17½ inches.

Black, White, Red, Yellow, Blue, and Black Lead, prepared on one or both sides.

Prices from 1½d. to 3d. per sheet; 2/- to 5/- per quire.

Tracing Papers.

IN SHEETS, 9 varieties, 30 by 20 inches, and 40 by 30 inches, Prices 1½d. to 5d. per sheet.

ROLLS of 21 yards, 27 varieties, 30, 31, 40, 43, 44, and 60 inches wide, 4/6 to 20/- per roll.

PATTERNS ON APPLICATION.

Solid Drawing Blocks.

Made of WHATMAN'S Drawing Paper.

	Inches.	* Series 2 20 Sheets. s. d.	* Series 3 24 Sheets. s. d.	* Series 3a 32 Sheets. s. d.	* Series 4 32 Sheets. s. d.
32mo Imperial	5 by 3½ each	1 2	0 9	1 0	0 9
16mo Royal	5½ ,, 4½ ,,	—	1 0	1 3	1 0
16mo Imperial	7 ,, 5 ,,	2 0	1 6	1 8	1 3
8vo Royal	9 ,, 5½ ,,	2 8	1 9	2 3	2 0
16mo Dble. Elept.	9 ,, 6 ,,	3 0	—	—	—
8vo Imperial	10 ,, 7 ,,	3 3	2 6	3 0	2 3
4to Royal	11½ ,, 9 ,,	5 3	3 3	4 0	3 6
8vo Dble. Elept.	12 ,, 9 ,,	5 6	—	—	—
6mo Imperial	14 ,, 6¾ ,,	4 9	3 3	4 0	3 3
4to Imperial	14 ,, 10 ,,	6 6	4 9	6 0	4 6
3mo Imperial	18 ,, 10 ,,	9 0	6 9	8 3	—
Half Royal	18 ,, 11½ ,,	—	7 6	8 6	—
4to Dble. Elept.	18 ,, 12 ,,	11 0	—	—	—
Half Imperial	20 ,, 14 ,,	12 6	10 0	12 6	—

SOLID DRAWING BLOCKS WITH COVERS & POCKETS.

Made of WHATMAN'S Drawing Paper.

		Half-bound Covers.			Brown Holland Covers.
	Inches.	* Series 2 20 Sheets. s. d.	* Series 3 24 Sheets. s. d.	* Series 3a 32 Sheets. s. d.	* Series 4 32 Sheets. s. d.
32mo Imperial	5 by 3½ each	2 0	1 6	1 8	1 6
16mo Royal	5½ ,, 4½ ,,	—	1 9	2 0	1 9
16mo Imperial	7 ,, 5 ,,	3 0	2 3	2 8	2 2
8vo Royal	9 ,, 5½ ,,	3 9	3 0	3 6	2 9
16mo Dble. Elept.	9 ,, 6 ,,	4 0	—	—	—
8vo Imperial	10 ,, 7 ,,	4 9	4 0	4 6	3 6
4to Royal	11½ ,, 9 ,,	7 6	5 3	6 0	5 3
8vo Dble. Elept.	12 ,, 9 ,,	8 0	—	—	—
6mo Imperial	14 ,, 6¾ ,,	7 0	5 3	6 0	5 0
4to Imperial	14 ,, 10 ,,	9 0	6 9	8 0	6 6
3mo Imperial	18 ,, 10 ,,	13 6	11 0	12 6	—
Half Royal	18 ,, 11½ ,,	—	12 0	13 0	—
4to Dble. Elept.	18 ,, 12 ,,	15 9	—	—	—
Half Imperial	20 ,, 14 ,,	18 0	16 0	18 6	—

** Series 2 is made of EXTRA THICK Paper; Series 3 & 3a of THICK Paper; Series 4 of IMPERIAL 72lbs: Paper.*

SOLID BLOCKS. Series 8.
FOR WATER COLOUR SKETCHING.

Made of Machine-made Paper, Not Surface. 20 Sheets.

9½ inches by 6 ... each 6d. 12 inches by 9½ ... each 1s.

SOLID DRAWING BLOCKS. Series 9 and 11.

	Inches				* Series 9 24 Sheets s. d.	* Series 11 32 Sheets s. d.
32mo Imperial	5	by	3½	... ... each	—	0 6
16mo Imperial	7	,,	5	... ...	0 6	0 8
8vo Royal	9	,,	5½	... ...	0 9	0 9
8vo Imperial	10	,,	7	... ...	1 0	1 0
4to Royal	11½	,,	9	... ...	1 6	1 6
6mo Imperial	14	,,	6¾	... ...	—	1 9
4to Imperial	14	,,	10	... ...	2 0	2 0

* *Series 9 is made of ENGINEER'S Cartridge Paper, and Series 11 of Thick IMITATION STEINBACH Paper.*

SCHOOL SOLID DRAWING BLOCKS. Series 10.

Made of Good White Cartridge Paper. 20 Sheets.

10 inches by 7 ... each 6d. 14 inches by 10 ... each 1s.

SCHOOL SKETCH BOOKS. Series 29.

(12 inches by 9½).

	s. d.
With Cloth Backs and Stiff Marble Paper Sides, containing 20 leaves of Cartridge Drawing Paper ... ... each	1 0

SKETCH BOOKS. Series 30 and 35.

Bound in Brown Holland, with Elastic Band.

Inches.	* Series 30	s. d.	* Series 35	s. d.
5 by 3½,	40 leaves each	0 6	40 leaves ... ... each	0 6
7 ,, 4½,	40 ,, ,,	1 0	†40 ,, ... ,,	0 9
9 ,, 5½,	32 ,, ,,	1 3	40 ,, ... ,,	1 0
10 ,, 7,	32 ,, ,,	1 6	40 ,, ... ,,	1 3
11½ ,, 9,	32 ,, ,,	2 0		
14½ ,, 10,	32 ,, ,,	2 6		

* *Series 30 is made of GOOD CARTRIDGE Drawing Paper, and Series 35 of Thick IMITATION STEINBACH Paper.*

† *Measures 7 by 5 inches.*

SKETCHERS' NOTE BOOKS. Series 33.

Made of Good White Paper, suitable for Rapid Pencil Sketches, Brown Holland Covers.

	Inches.		s. d.
No. 1 ...	5½ by 4,	80 leaves in each Book ... ... each	0 9
,, 2 ...	8½ ,, 5½	... ... ,,	1 3
,, 3 ...	11 ,, 8½	... ... ,,	2 0

SOLID BLOCKED SKETCH BOOKS.

Made as Sketch Books, but with the three outer edges fastened as ordinary Solid Blocks.

Made of WHATMAN'S Drawing Paper.

		Half-bound Leather Backs, cloth sides.		Brown Holland Covers.		
		*Series 21. 20 Leaves. s. d.	*Series 22. 32 Leaves. s. d.	*Series 21a. 20 Leaves. s. d.	*Series 22a. 32 Leaves. s. d.	*Series 23. 24 Leaves. s. d.
32mo Imperial	... each	—	1 6	—	1 3	1 0
24mo ,,	... ,,	—	2 0	—	1 8	1 3
16mo ,,	... ,,	2 6	2 6	2 3	2 3	1 6
8vo Royal	... ,,	3 6	3 3	3 0	3 0	2 0
12mo Imperial	... ,,	—	3 3	—	3 0	2 0
8vo ,,	... ,,	4 3	4 3	3 9	3 9	2 6
4to Royal	... ,,	—	6 0	—	5 3	3 6
4to Imperial	... ,,	7 6	7 6	6 9	6 9	5 0

**Series 21 & 21a are made of EXTRA THICK Paper; Series 22 & 22a of THICK PAPER, and Series 23 of IMPERIAL 72-lbs. Paper.*

SKETCH BOOKS.

Made of WHATMAN'S or TINTED CRAYON Papers, each containing 30 leaves.

	Inches.		Half-bound Leather Backs, cloth sides.		Brown Holland Covers.	
			*Series 24 s. d.	*Series 25. s. d.	*Series 26. s. d.	*Series 27. s. d.
32mo Imperial	5 by 3½	... each	1 0	0 11	0 9	0 8
24mo ,,	7 ,, 3¼	... ,,	1 3	1 2	1 0	1 0
Pocket Size	7 ,, 4½	... ,,	1 6	1 4	1 3	1 2
16mo Imperial	7 ,, 5	... ,,	1 6	1 4	1 3	1 2
8vo Royal	9 ,, 5½	... ,,	2 0	—	1 6	—
12mo Imperial	10 ,, 4½	... ,,	2 6	2 3	1 9	1 6
8vo ,,	10 ,, 7	... ,,	3 0	2 9	2 3	2 0
4to Royal	11½ ,, 9	... ,,	3 9	—	3 0	—
4to Imperial	14½ ,, 10	... ,,	5 3	4 9	4 6	4 0

**Series 24 and 26 are made of WHATMAN'S Paper; Series 25 and 27 of TINTED CRAYON Paper.*

BLACK & WHITE SKETCH BOOKS. Series 34.

Made of EXTRA THIN BANK Paper, suitable for Pencil, Pen, or Colour Drawings.

Each Book contains 94 Leaves, perforated on interior edge.

	Inches.		s. d.		Inches.		s. d.
No. 1,	3½ by 3	... each	0 5	No. 4,	8 by 5	... each	1 0
,, 2,	5 ,, 3¼	... ,,	0 8	,, 5,	10 ,, 8	... ,,	1 6
,, 3,	7¼ ,, 4½	... ,,	0 10				

SCHOOL DRAWING BOOKS.

Made of BEST CARTRIDGE Drawing Paper.

WITH ILLUSTRATED TINTED PAPER COVERS.

20 LEAVES IN EACH BOOK.

	Inches.		s.	d.	Interleaved with Tissue. s.	d.
8vo Royal	9 by $5\frac{1}{2}$	each	0	6	0	7
8vo Imperial	10 ,, 7	,,	0	9	0	10
4to Royal	$11\frac{1}{2}$,, 9	,,	1	0	1	1
4to Imperial	$14\frac{1}{2}$,, 10	,,	1	6	1	8

STUDENTS' DRAWING BOOKS.

Made of SUPERIOR CARTRIDGE Paper.

TINTED PAPER COVERS.

NEW SERIES.

Nos.	Inches.				s.	d.
11	9 by $5\frac{1}{2}$	8 leaves		each	0	1
12	10 ,, 7	12 ,,		,,	0	2
13	$11\frac{1}{2}$,, 9	16 ,,		,,	0	3
14	$14\frac{1}{2}$,, 10	16 ,,		,,	0	4
15	$14\frac{1}{2}$,, 10	24 ,,		,,	0	6
16	$14\frac{1}{2}$,, 10	40 ,,		,,	0	9
17	$14\frac{1}{2}$,, 10	12 ,,	interleaved tissue	,,	0	4
18	$14\frac{1}{2}$,, 10	20 ,,	,,	,,	0	6
19	$14\frac{1}{2}$,, 10	30 ,,	,,	,,	0	9

In ordering it is only necessary to give the Number prefixed to each size.

GILT BEVELLED EDGE CARDS.

IN BOXES OF 50.

Inches.		Whatman's Surface. s.	d.	Assorted Tints & Surfaces. s.	d.	Imitation Canvas Surface for Oil Painting. s.	d.
$4\frac{1}{2}$ by 3	per box	3	0	3	0	4	0
5 ,, $3\frac{1}{2}$	,,	4	0	4	0	5	0
$5\frac{1}{4}$,, 4	,,	4	6	4	6	6	0
6 ,, $4\frac{1}{2}$	,,	5	6	5	6	7	0

The above are also put up in boxes, containing an assortment of sizes at 1s. each.

WATER COLOUR SKETCHING BOARDS.

Mounting Boards covered with Whatman's Paper on One Side.

Hotpressed, Not, and Rough Surfaces.

	Inches.	Each. s.	d.		Inches.	Each s.	d.
16mo Imperial ...	7 by $4\frac{3}{4}$	0	1	4to Imperial ...	$14\frac{1}{2}$ by $10\frac{5}{8}$	0	5
8vo Royal ...	$9\frac{1}{8}$,, $5\frac{3}{4}$	0	$1\frac{1}{2}$	Half Royal ...	$18\frac{1}{4}$,, $11\frac{1}{2}$	0	6
6mo Royal ...	$11\frac{1}{2}$,, 6	0	2	Half Imperial	$21\frac{1}{4}$,, $14\frac{1}{2}$	0	9
8vo Imperial ...	$10\frac{5}{8}$,, $7\frac{1}{4}$	0	$2\frac{1}{2}$	Royal	23 ,, $18\frac{1}{4}$	1	0
4to Royal ...	$11\frac{1}{2}$,, $9\frac{1}{8}$	0	3	Imperial ...	29 ,, $21\frac{1}{4}$	1	6
6mo Imperial ...	$14\frac{1}{4}$,, 7	0	3				

Also covered with Whatman's "Special Surface" Drawing Paper for Black and White Drawing. Prices same as above.

"BLACK AND WHITE" BOARDS.

Made in one thickness only of Paper specially selected and manufactured for this purpose.

Suitable for either Pen, Wash, or Colour.

	Inches.	Per packet of 6 Boards. s.	d.		Inches.	Per packet of 6 Boards. s.	d.
No. 1 ...	$7\frac{1}{8}$ by $5\frac{1}{4}$	0	6	No. 4 ...	$14\frac{1}{2}$ by $10\frac{1}{2}$	1	9
,, 2 ...	$10\frac{1}{2}$,, $7\frac{1}{8}$	1	0	,, 5 ...	$18\frac{1}{2}$,, $11\frac{3}{4}$	2	3
,, 3 ...	$11\frac{3}{4}$,, $9\frac{1}{2}$	1	3	,, 6 ...	$23\frac{1}{2}$,, $18\frac{1}{2}$	4	0

BRISTOL BOARDS.

BEST QUALITY.				2 sheet s.	d.	3 sheet. s.	d.	4 sheet. s.	d.	6 sheet. s.	d.
Foolscap ...	$15\frac{1}{4}$ inches	by $12\frac{1}{2}$	each	0	2	0	3	0	4	0	6
Demy ...	$18\frac{3}{4}$,,	$14\frac{1}{2}$	,,	0	3	0	5	0	6	0	9
Medium ...	21 ,,	$16\frac{3}{4}$	,,	0	4	0	6	0	8	1	0
Royal ...	$22\frac{1}{2}$,,	18	,,	0	6	0	8	1	0	1	4
Imperial ...	$28\frac{1}{2}$,,	21	,,	0	10	1	3	1	8	2	6

CUT-OUT MOUNTS, &c.

Messrs. WINSOR & NEWTON, Limited, pay particular attention to Cut-out Mounts; they also undertake to mount Drawings, &c., intrusted to them, with care and despatch.

MOUNTING BOARDS.

WHITE OR TINTED (15 TINTS).

Series 1—EXTRA SUPERFINE.

					3 sheet. s.	d.	4 sheet. s.	d.	6 sheet. s.	d.	8 sheet. s.	d.
Half Imperial	21¼	inches by	14½	each	0	3	0	4	0	6	—	
Royal ...	24	,,	19	,,	0	4	0	6	0	8	—	
Imperial ...	29	,,	21¼	,,	0	6	0	8	1	0	1	4
Atlas ...	33¼	,,	26	,,	—		1	4	2	0	2	8
Dble. Elephant	39	,,	26	,,	—		1	6	2	3	3	2

Series 2—LONDON.

					4 sheet. s.	d.	6 sheet. s.	d.	8 sheet. s.	d.
Half Imperial ...	21¼	inches by	14½	each	0	3	0	4	0	5
Royal	24	,,	19	,,	0	4	0	5	0	7
Imperial	29	,,	21¼	,,	0	5	0	7	0	9
Atlas	33¼	,,	26	,,	—		1	0	1	3
Dble. Elephant ...	39	,,	26	,,	—		1	2	1	6
Dble. Imperial ...	43	,,	29	,,	—		1	6	1	9
*Leviathan	43	,,	34	,,	—		3	0	3	9
*Antiquarian ...	53	,,	35	,,	—		7	0	9	0

Series 3—FINE.

					4 sheet. s.	d.	6 sheet. s.	d	8 sheet. s	d
Half Imperial ...	21¼	inches by	15½	each	0	2	0	3	0	4
Royal	24	,,	19	,,	0	3	0	4	0	5
Imperial	31	,,	21¼	,,	0	4	0	6	0	8

Series 4—SCHOOL.

						Ordinary. s.	d.	Best. s.	d.
Royal ...	24	inches by	19, Medium Thick	...	each	0	2	0	2½
,, ...	24	,,	19, Thick ...	...	,,	0	3	0	3½
Imperial ...	31	,,	21, Medium Thick	...	,,	0	3	0	3½
,, ...	31	,,	21, Thick ..	...	,,	0	4	0	5

* Not made in tints, 55, 56, 59, 62, 65, 66, 67, and 69.

Patterns of Tints may be had on application.

WINSOR & NEWTON'S
Nonpariel Drawing Pencils.

HEXAGON ORANGE-POLISHED CEDAR, 4d. each.

These are a new variety of Drawing Pencils made from carefully selected British Graphite. They may be used with confidence for all Drawings in which a high-class Drawing Pencil—reliable for smoothness in working and evenness of colour—is a *sine qua non.*

Nonpariel Drawing Pencils are manufactured in twelve degrees viz. : HHHHHH, HHHHH, HHHH, HHH, HH, H, F, HB, B, BB, BBB, and BBBB, and stamped in gold—" Nonpariel Drawing Pencil, Winsor & Newton, Ltd."

WINSOR & NEWTON'S
Drawing Pencils.

PENNY Pencils, of good quality, for Schools and ordinary use, Round and Hexagon.

TWOPENNY Pencils, Round and Hexagon, strongly recommended for their richness of colour, and variety and evenness of tint.

SIXPENNY Cumberland Pencils, made expressly for the use of Artists, with an extra thickness of lead.

1s. Boxes, containing Six Drawing Pencils, Four Drawing Pins, India-Rubber, and a Stick each of Red, White and Black Crayon.

2s. Boxes, containing Six Best Engineer's Hexagon Natural Polished Drawing Pencils of Hard and Suitable Degrees.

WINSOR & NEWTON'S
Sketching Pencils.

Ever-pointed, four inches in length, with extra thick lead ... each, **6d.**

Re-fills for above, in boxes containing three Leads ... per box, **6d.**

Coloured Pencils.

Blue, Red, Green, and combined Blue and Red Pencils, in Coloured Polished Cedar. Best quality, **3d.**; Second quality, **2d.** each.

COMPASS PENCILS, plain Cedar, three sizes, two degrees, per dozen, **4d.**

Creta Levis Pencils,

FORTY-EIGHT TINTS.

In Coloured Polished Cedar ... ... 3d. each.
Boxes containing from 6 to 48 Pencils, assorted tints, 2/- to 13/6 per box.

Lefranc's Soft Pastel Crayons.

ASSORTED COLOURS.

NOTICE.—These Crayons, being fragile, are LIABLE to breakage in transit, and can only be sent at Purchaser's risk. Their utility, however, is not impaired by their being in pieces.

	s.	d.		s.	d.
Box containing 26 Crayons	3	6	Box containing 100 Crayons	15	0
,, ,, 40 ,,	4	6	,, ,, 132 ,,	20	0
,, ,, 56 ,,	6	6	,, ,, 156 ,,	23	3
,, ,, 62 ,,	9	6	,, ,, 200 ,,	33	0

Round Pointed Pastel Crayons.

IN ROUND FANCY CARDBOARD BOXES.	Best Quality. s.	d.	Second Quality. s.	d.
Box containing 6 assorted Crayons	—		0	2
,, ,, 12 ,, ,, ...	0	9	0	3
,, ,, 18 ,, ,, ...	1	3	0	4
,, ,, 24 ,, ,, ...	1	9	0	6
,, ,, 30 ,, ,, ...	2	3	0	9
,, ,, 36 ,, ,, ...	2	9	1	0
,, ,, 48 ,, ,, ...	3	3	—	

Crayons and Chalks.

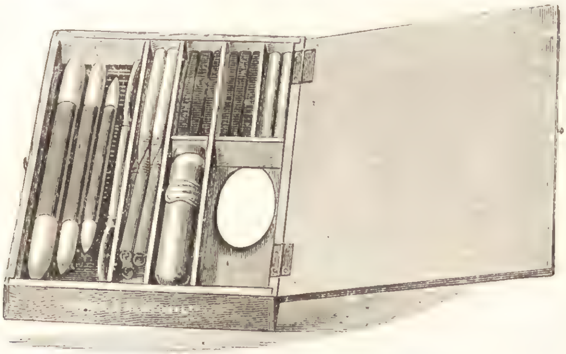
Conté Crayons, Black, Red, and White, Round and Square, in
Boxes of 12 sticks ... ... each 6d. to 1/3.
Ditto in Cedar ... ... ,, 2d. & 3d.
Conté Stumping Chalk, in Tinfoil ... ... per stick, 3d., 4d., & 6d.
,, ,, ,, in Glass Bottles ... ... per bottle, 6d.
Winsor & Newton's Stumping Chalk, in Tinfoil,
per doz., small 1/-, large 1/3.
Lemoine's White Crayons ... per box of 12, Square 6d., Round 9d.
Chalk, Parmenter's Round White ... ... per gross box, 9d.
,, ,, ,, Enamelled... ... ... ,, ,, 1/-.
,, Coloured Demonstration, assorted colours, per box of 12, 6d.

CHARCOAL, in Bundles and in Boxes, various sizes and qualities.

STUMPING PALETTES, Oval, lined Chamois Leather ... each 1/-.

Thumb-Hole Palette Chalk Box.

FOR STUDENTS, SCHOOLS OF ART, &c.


STUMPING PALETTE.

Size of Box when open, $10\frac{1}{2}$ by $6\frac{3}{4}$ inches.
Ditto when closed, $6\frac{3}{4}$,, $5\frac{1}{4}$,,

The Lid of this Box is covered inside with Chamois Leather, which forms a Stumping Palette, and the thumb-hole is arranged to allow the Box being held on the hand as easily as an ordinary Palette.

The Box contains—Four each Nos. 1, 2, and 3, Square Black Conté Crayons; Two each Nos. 1 and 2 Lemoine's Round White Crayons; a Bottle of Stumping Chalk (Velours à Sauce); Two White Paper Stumps; One No. 2 White Leather Stump; Four each White and Grey Tortillons and a Portcrayon.

The Box complete, weighs under 8 oz.

Fitted complete, 3s. 6d.; empty, 2s.

The "Handy" Chalk Box.

The sliding lid of the Box is lined with Chamois Leather, and fitted with a thumb-strap, forming a convenient Stumping Palette.

The Box contains—Six Black and Four White Conté Crayons; a Stick of Stumping Chalk; Two White Paper Stumps; Six Tortillons; a Brass Portcrayon and a Drawing Pencil.

Fitted complete, 1s. 6d.; empty, 1s.

Conté Leather Stumps.

(WHITE OR CHAMOIS LEATHER.)

			s.	d.				s.	d.
No. 1	...	per dozen	1	6	No. 5	...	per dozen	3	3
,, 2	...	,,	1	9	,, 6	...	,,	4	0
,, 3	...	,,	2	0	,, 7	...	,,	4	6
,, 4	...	,,	2	6	,, 8	...	,,	5	6

Conté Paper Stumps.

			Grey.		White.					Grey.		White	
			s.	d.	s.	d.				s.	d.	s.	d.
No. 1	...	per dozen	0	4	0	6	No. 5	...	per dozen	0	8	0	11
,, 2	...	,,	0	5	0	7	,, 6	...	,,	0	9	1	0
,, 3	...	,,	0	6	0	8	,, 7	...	,,	0	11	1	3
,, 4	...	,,	0	6	0	9	,, 8	...	,,	1	0	1	6

Conté Tortillons.

		Per Bundle.	
		s.	d.
Grey Paper	(in bundles of 1 dozen)	0	1½
White Paper	,, ,,	0	2
,, large size	,, ,,	0	3
Tissue Paper	,, ,,	0	3

India Rubber.

	Per lb.	
	s.	d.
Best Para (Bottle) Rubber, cut to various sizes	12	0
Best White Soft Rubber, 6, 12, 18, 24, 36, and 72 pieces to lb....	5	6
Best Pink Soft Rubber, 6, 12, 18, and 24 pieces to lb.	5	6
Best Stationer's Rubber, 6, 12, 18, 24, 36, and 72 pieces to lb. ...	7	0
White School Rubber, 12, 16, 30, and 60 pieces to lb.	3	0
Artist's Rubber, Extra Quality, 10, 15, 20, 30, and 60 pieces to lb.	4	6
Kneaded Rubber 20 pieces to lb. ... ... per piece	0	3

Pencil Pointed Rubber ... ... in sticks, each 1d., 2d., 3d., and 4d.

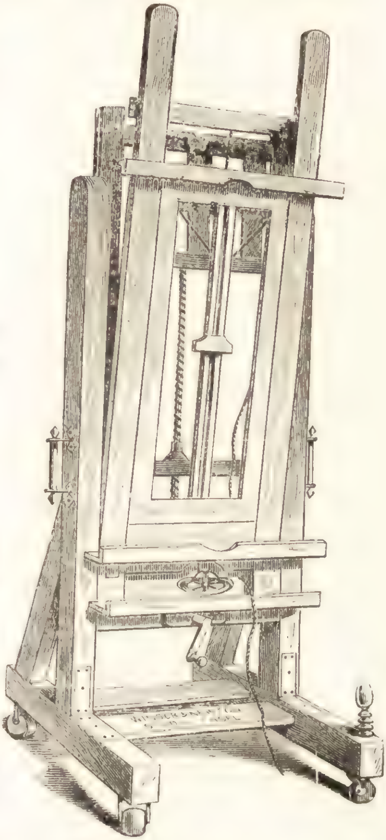
Nigrivorine Rubber, double pointed ... in sticks, each 1d., 2d., and 3d.

Ink and Pencil Erasers ... ... each 4d.

Webster's Chalk Erasers ... ... each 6d.

Improved Studio Easels.

WINSOR & NEWTON'S IMPROVED STUDIO EASEL will carry canvases of any size to 9 feet 6 inches in height. The arrangement for projecting a canvas in a forward position is simple and effective; the Easel has a screw winding-up movement that is managed with the utmost facility, and which raises with ease a framed picture or Canvas of considerable weight.



	Each. £ s. d.
SMALL STUDIO EASEL, 5 feet high, which will carry a canvas 7 feet high.	
Stained Deal ...	11 11 0
Polished Oak ...	14 14 0
MIDDLE STUDIO EASEL, 6 feet high, which will carry a Canvas 8 feet high.	
Stained Deal ...	12 12 0
Polished Oak ...	15 15 0
LARGE STUDIO EASEL, 7 feet high, which will carry a Canvas 9½ feet high.	
Stained Deal ...	13 13 0
Polished Oak ...	17 17 0

Polished Oak Studio Easels.

G	7½ feet high, with screw winding-up movement	£5 0 0
H	Ditto ditto and forward movement	£8 0 0

Winsor and Newton's Easels.

SKETCHING EASELS.

No.		EACH. £ s. d.
1.	Polished Stained Pine Sketching Easel with sliding adjustable Legs, and Brass Arm which holds sketch firmly at any angle, 6 feet high open, 41 inches when closed...	1 2 0
	Also supplied in natural polished Pine at the same price.	
1A.	American White-Wood Sketching Easel, with sliding adjustable Legs, 6 feet high open, 41 inches closed ...	0 11 0
	Ditto ditto Polished ...	0 14 0
1B.	The "Amateur" Bamboo Sketching Easel, 4 feet high, (the lightest Easel made)	0 5 6
2.	Folding Sketching Easel, American White Wood, 4 feet 2 inches high	0 2 6
2A.	Superior Folding Sketching Easel, 4 feet 2 inches high ...	0 4 0
2B.	Ditto Ditto ditto, 4 ,, 2 ,, ,, with self-adjusting springs to fasten each leg... ...	0 6 6
2C.	Ditto ditto 5 feet high ditto	0 8 0
2D.	Sketching Easel, with sliding adjustable legs, Brass fittings and rack, 5 feet high, 36 inches when closed	0 12 6
20.	The "Walking-Stick" Sketching Easel, Polished Oak. Patent application No. 9096. The most compact Easel made, practical and efficient. It serves the purposes of a Walking Stick when closed, and an Easel when open. The wire pegs for holding the Canvas are contained, when not in use, in grooves cut on the inside of the back leg	0 5 6
23.*	The "Radial" Sketching Easel, stained and polished Pine. Heath's Patent. 4 feet 6 inches high open, 24 inches when closed	0 14 0
24.*	Ditto ditto 6 feet high, 30 inches when closed	0 16 0

(No. 23 is suitable for carrying on the handle-bars of a bicycle, and was originally made for that purpose).

Illustrated descriptive pamphlet of the "Radial" Easels post free on application.

Winsor and Newton's Easels.

STANDING EASELS.

No.			Each. £	s.	d.
3A.	Framed Rack Easel, Deal	5 feet 6 inches high	0	9	6
4.	Closing Easel, Deal	6 feet high	0	7	0
4B.	,, ,, Spruce, inexpensive, for students	Ditto	0	3	9
4C.	,, ,, ,, ...	4 feet 6 inches high	0	3	0
5.	,, ,, Mahogany	6 feet high	0	15	0
6.	Framed Easel, Deal	Ditto	0	10	6
7.	,, ,, Mahogany	Ditto	1	1	0
10.	Rack Easel, Mahogany, with tray	Ditto	1	17	6
11.	,, ,, ,, with brush box ...	Ditto	2	10	0
12.	,. Academy Easel, Mahogany ,, ...	Ditto	3	1	6
13.	,, Corbould	Ditto	3	15	0
14.	,, ,, ,, ,, ,, and Desk	Ditto	4	15	0
15.	Dwarf Rack Easel, Deal, 4 feet high, the rack heightening the Easel to 6 feet 6 inches		1	10	0
16.	Ditto, Mahogany Ditto		2	5	0
17.	Rack Easel, Beech, with forward movement, 6 feet high		1	15	0
18A.	The "Radial" Students' Easel, Deal...		1	8	0

Illustrated descriptive pamphlet of the "Radial" Easels post free on application.

TABLE EASELS

No.		s.	d.
30.	Deal, 18 inches high	1	3
31.	,, 21 ,, ,, ...	1	6
32.	,, 24 ,, ,, ...	1	9

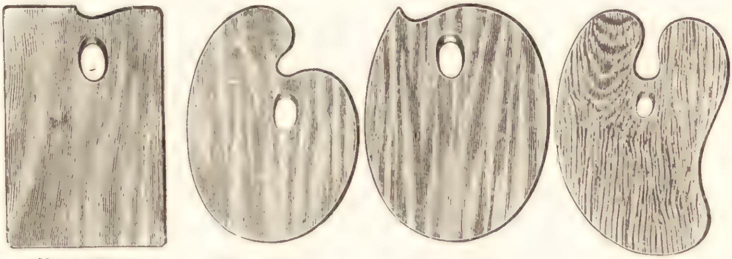
PATENT HATHERLEY EASELS.

		s.	d.			s.	d.
A	15 inches high	2	6	B	45 inches high	6	6
AA	15 ,, ,, for music	3	0	C	56 ,, ,, ...	7	6

D Studio Easel, 6 feet high ... 8*s.* 6*d.*

Palettes.

SPANISH MAHOGANY AND OTHER WOODS.



No. 1 Shape. No. 2 Shape. No. 3 Shape. No. 4 Shape.

No. 4 is only made in 18, 20, 22, and 24-inch Palettes.

Spanish Mahogany.

Length		s.	d.
8 inches	each	0	9
9 ..	..	1	0
10 .	..	1	3
11 ..	..	1	6
12 ..	.	1	9
13 .	.	2	0
14 ..	..	2	6
15 .	..	2	9
16 ..	..	3	0
17 ..	..	3	6
18 ..	..	4	0
20 ..	..	5	3
22		6	0
24 ,,	,,	6	9
12 ,, Folding Palettes	each	3	0

Satin Wood.

Length		s.	d.
8 inches	each	2	3
9 ..	..	2	6
10 ,.	..	3	0
11 ..	..	3	3
12 ,,	,,	3	6
13 ,,	,,	4	3
14 ,,	,,	5	0
15 ,,	,,	5	6
16 ..	..	6	0
17 ,,	,,	6	6
18 ,,	,,	6	9
12 ,, Folding Palettes	each	5	6

Mahogany.

To fit the following Oil-Colour Boxes.

		s.	d.
Pupil's	each	0	6
Pocket	..	0	9
Tourist's	.	1	0
Compact	..	1	3
Student's	.	1	6
Companion ..	..	1	9
Portable	.,	2	0
Academy ..	.,	1	9
No. 1 Studio	.,	1	9
No. 2 Studio	..	2	6
No. 3 Studio	,,	3	0
Sketching Box (Folding Palette)		3	0
Landscape Box (Walnut Palette)		1	9

No. 1 Shape is sent unless otherwise ordered.

Mahl Sticks.

	Each. s.	d.
Bamboo or White Wood, 46 inches ...	0	6
Brass-jointed, White Wood; 36 inches in two pieces	1	0
,, ,, 36 ,, three ,,	1	6
,, ,, 44 ,, four ,,	2	0
,, Polished Bamboo, 38 inches in two pieces	2	6
,, ,, 38 ,, three ,,	3	0
,, ,, 44 ,, four ,,	3	6
,, ,, 56 ,, five ,,	4	0
Telescopic Bamboo, extending to 36 inches	4	0

Palette Knives.

WITH BEST STEEL BLADES.

			LENGTH OF BLADE 3, 3½, & 4 in. s. d.	4½ in. s. d.	5 in. s. d.
No. 540	Cocoa Handle	each	0 8	0 9	0 10
,, 541	,, balanced ..	..	0 9	1 0	1 0
,, 542	Ebony handle ...		0 8	0 9	0 10
,, 543	,, balanced ..		0 9	1 0	1 0
,, 547	Ivory handle, balanced ...	.	2 0	2 0	2 3
,, 554	Cocoa handle, Trowel shape	..	1 8	1 9	2 0

Painting Knives.	No. 1. s. d.	No. 2. s. d.	No. 3. s. d.	No. 4. s. d.	No. 5. s. d.
Very Thin Blades ... each	2 6	2 0	2 0	1 3	2 0

Ivory Palette Knives.—No. 1, 4½ inches, 1/- ; No. 2, 6 inches, 1/3 ; No. 3, 7 inches, 1/6 ; No. 4, 8 inches, 2/- each.

Steel and Tin Ware.

Dippers, Plain Tin	2d. to 1/4 each.
,, Japanned Tin	4d. to 1/6 ,,
Brush Washers, Plain Tin ...	1/3 & 2/- each.
Do. Japanned	1/9 & 2/3 ..
Oil Bottles, Screw Tops, Japanned ...	1/3 ..
Scrapers	5d. & 2/- ..
Erasers	1/- & 1/2 ..

Drawing Boards.

IN BEST SEASONED DEAL OR MAHOGANY.

	Inches.		Clamped Deal. s. d.	Panelled Deal. s. d.	Framed Mahogany. s. d.
4to Royal	10½ by 8	each	1 0	1 6	5 0
4to Imperial	13 ,, 9½	..	1 3	2 0	6 0
4to Imperial, full size	16 ,, 11½	..	1 6	2 10	—
Half Royal	17 ,, 10½	..	1 8	2 10	8 0
Demy	18 ,, 13½	..	1 9	3 3	—
Half Imperial	19 ,, 13½	..	1 10	3 6	8 8
Medium	20 ,, 15½	..	2 6	4 0	—
Half Imperial, full size	23 ,, 16	..	2 8	4 9	—
Royal	22 ,, 17	..	2 8	4 9	12 8
Half Dble. Elephant ...	24 ,, 19	..	3 3	5 6	—
Imperial	28 ,, 19	..	4 0	6 3	16 6
Imperial, full size ...	31 ,, 23	..	5 3	8 4	—
Double Elephant ...	38 ,, 24	..	8 6	12 6	—
Double Elephant, full size	41 ,, 28	..	12 6	–	—

The "Triple" Deal Drawing Boards.

PROTECTED.

Three layers of well-seasoned wood—the centre being placed transverse to the other two—are firmly glued together under great pressure. By this method the liability to warp and twist, which was too common a feature of boards made on the old principle, is reduced to a minimum. The satisfactory character of the "Triple" Drawing Boards is attested by the fact that they are fast superseding the ordinary Clamped Deal Boards.

Sizes and prices the same as Clamped Deal Boards above.

Engineers' Drawing Boards.

These Boards are made of the best picked Dry Pine, one end inlaid Ebony, with mahogany battens at back, having Brass Slots, which allow for the expansion and contraction of the wood. Engineers' Boards are warranted not to get out of the square or to split.

	Inches.		s. d.
Half Imperial	23 by 16	... ... each	8 0
Half Dble. Elephant	28 ,, 21	... ... ,,	10 6
Imperial	32 ,, 23	... ... ,,	12 6
Dble. Elephant	41 ,, 28	... ... ,,	20 0
Antiquarian	54 ,, 32	... ... ,,	28 6

Sketching Portfolios,

With Japanned Tin Frames to fasten the Paper down.

Half-Bound, with Leather Outside Flap, and Linen Inside Flaps to hold loose Sketches, or Reserve of Paper.

	Inches outside Frame.		s.	d.
8vo Imperial	$11\frac{1}{2}$ by 8	each	4	6
4to Royal	$12\frac{1}{2}$,, $9\frac{3}{4}$	,,	5	3
6mo Imperial	$15\frac{1}{2}$,, $7\frac{3}{4}$	,,	6	0
4to Imperial	16 ,, $11\frac{1}{4}$	,,	6	6
4to Double Elephant ...	$20\frac{1}{2}$,, $13\frac{3}{4}$	,,	10	6
3mo Imperial	$22\frac{1}{2}$,, $10\frac{1}{2}$	,,	10	6
Half Imperial	$22\frac{1}{2}$,, $15\frac{1}{2}$	,,	12	9

Sketching Stools and Seats.

No.		Each. s.	d.
1.	Pocket Stool, loose seat, 18, 21, and 24 inches	2	3
1A	Ditto fixed seat, 21 inches	3	0
2.	Ditto best make, fixed seat, 18, 21, and 24 inches ...	6	9
3.	Square, loose seat, 21 inches...	3	9
4.	,, ,, 24 ,, ...	4	0
5.	Square, fixed seat 17 ,, ...	4	6
6.	,, ,, 21 ,, ...	5	3
7.	Gentlemen's Seat and Easel Combined	18	9
8.	Ditto best quality, leather seat	31	6
9.	The Lannigan Stool, size when closed $19\frac{1}{2}$ in. by $10\frac{1}{4}$ by 2 ...	3	0
10.	Loose Leather Seat, 24 inches, extra strong	10	0
11.	The "Yeend King" Stool, extra strong, adjustable canvas seat	14	0
12.	Sketching Bag Seat, a combination of a Sketching Bag and a good strong stool...	7	6

Sketching Umbrellas.

No.		£	s.	d.
1.	Covered Brown Holland or Grey Twill Silicia...	1	4	0
2.	Ditto with movable top joint	1	8	0
3.	Improved make, with movable top joint, and sliding joint for alteration of height	1	13	0
4.	Ditto suitable for ladies, nickel silver fittings ...	1	13	0
6.	Covered Brown Holland, movable top joint	0	16	0
7.	French make...	0	18	0

Best Portfolios.

MOROCCO BACK, AND OUTSIDE FLAP WITH GOLD FILLETS.

BEST CLOTH SIDES AND INSIDE STIFF CLOTH FLAPS.

					s.	*d.*
Half Demy	15½ inches by	10½		each	5	6
4to Imperial	15	,,	11	,,	6	0
Music	16	,,	11	,,	6	0
Half Medium	17	,,	11½	,,	7	0
Half Royal	19	,,	13 ...	,,	8	6
Demy	21	,,	15½	,,	10	0
Half Imperial	22½	,,	15½	,,	10	6
Medium	22	,,	17	,,	10	6
Royal	25	,,	19 ...	,,	13	6
Super Royal	27	,,	20 ...	,,	15	0
Imperial	31	,,	22	,,	21	0
Atlas	34	,,	26	,,	27	0
Colombier	36	,,	24	,,	30	0
Double Elephant ...	40	,,	28	,,	37	6

BEST BRAMAH LOCKS FITTED TO ANY OF THE ABOVE AS ILLUSTRATED, 6S. EXTRA.

Portfolios.

WITH OR WITHOUT STIFF INSIDE FLAPS.

		SUPERIOR, Roan Leather Back and Corners, Cloth Sides, & Silk Strings.				SCHOOL OF ART, Cloth Back and Corners, Marble Paper Sides.			
		Without Flaps.		With Flaps.		Without Flaps.		With Flaps.	
		s.	d.	s.	d.	s.	d.	s.	d.
Half Demy ...	each	2	0	2	8	1	0	1	6
4to Imperial	,,	2	0	2	8	1	0	1	6
Music ...	,,	2	0	2	9	1	0	1	6
Half Medium	,,	2	6	3	3	1	3	1	8
Half Royal	,,	3	0	4	0	1	6	2	0
Demy ...	,,	3	6	5	0	1	8	2	6
Half Imperial	,,	4	0	5	6	1	10	2	9
Medium ...	,,	4	6	6	0	2	0	3	0
Royal ...	,,	5	6	7	6	2	6	3	6
Super Royal	,,	6	9	10	0	2	9	4	0
Imperial ...	,,	9	6	12	0	3	6	5	0
Atlas ...	,,	15	0	18	0	6	0	8	6
Columbier ...	,,	15	0	18	0	6	0	8	6
Double Elephant...	,,	20	0	24	0	9	0	12	0

The "Useful" Portfolios.

WITH LOCK.

CLOTH BACK AND CORNERS, LEATHER PAPER SIDES.

WITH OR WITHOUT INSIDE FLAPS.

				Without Flaps.		With Flaps.	
				s.	d.	s.	d.
4to Imperial ...	15 inches by	11 inches ...	each	1	3	1	9
Music ...	16 ,,	11 ,,	,,	1	6	2	0
Half Royal ...	19 ,,	13 ,,	,,	2	0	2	6
Half Imperial ...	$22\frac{1}{2}$,,	$15\frac{1}{2}$,,	,,	2	3	3	0
Royal ...	25 ,,	19 ,,	,,	3	0	3	9
Imperial ...	31 ,,	22 ,,	,,	4	0	5	3

Pencil Cases.

CLOTH OR LEATHER.

ROUND.	Cloth. s. d.	Leather. s. d.	Best Leather s. d.
No. 1. 7 inches long by 1 inch diameter, each	0 3	0 7	0 9
,, 2. 7 ,, 1½ ,, ,,	0 5	0 9	1 0
,, 3. 7 ,, 1¾ ,, ,,	0 6	1 0	1 3

FLAT.	Cloth. s. d.	Leather s. d.
To contain 3 Pencils ... ... each	0 3	0 9
,, 4 ,, ... ,,	0 4	0 10
,, 6 ,, ... ,,	0 5	1 0

Japanned Tin Brush Cases,

WITH OR WITHOUT HANDLES.

OVAL.
With removable metal division to protect the points of the Brushes.

	s. d.
No. 1. 8½ inches long... ... each	2 3
,, 2. 10 ,, ... ,,	2 6
,, 3. 14 ,, ... ,,	3 0

ROUND.
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